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EXPLORATORY STUDY OF THE POTENTIAL EFFECTS OF EXPOSURE
TO SONIC BOOM ON H... (U) SYSTEMS RESEARCH LABS INC

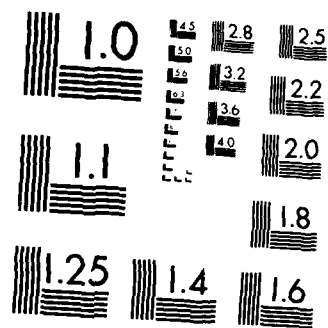
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19. ABSTRACT (Continue on reverse if necessary and identify by block number) A study has been carried out to investigate possible human health effects caused by exposure of people to sonic boom. The subjects of the study were the residents of the State of Nevada. This state was selected for the study because supersonic military flight operations have been carried out in Nevada, primarily within the boundaries of the Tactical Fighter Weapons Center (TFWC) Range Complex near Las Vegas, longer than in any other area within the United States. This volume presents estimates of sonic boom environments in the State of Nevada during the period from 1969 to 1983. The estimates are based on an extensive analysis of historical records (from Nellis Air Force Base) of supersonic fighter aircraft operations within the TFWC Range Complex, and on available computerized records of supersonic operations of both fighter and SR-71 aircraft within all areas inside the State of Nevada. These latter computerized records are maintained in a Sonic Boom Inquiry Data Base by the Department of Defense, and are intended to include records of all military or DOD-contractor supersonic flight operations throughout the United States. While gaps in				
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7 this data base may exist, the estimates of sonic boom environments in this report are considered sufficiently reliable to use in searching for a possible link to health effects. Volume II, prepared by the Department of Community and Environmental Medicine of the University of California, Irvine, reports the results of this search in an extensive statistical analysis probing for any possible correlation between the sonic boom exposure estimates reported herein and all available health data (mortality and morbidity) for Nevada residents for the same geographic areas and time periods. From the data collected in this study and presented in these two volumes, no convincing evidence was found to prove or disprove the existence of adverse health effects due to exposure to sonic boom.

In summary, this study has clearly demonstrated the viability of acquiring and analyzing the global measures of sonic boom environment and health effects utilized for this study. However, it has also demonstrated that the specific global measures employed in this study do not show any evidence for the existence of possible health effects due to sonic boom exposure. Any such evidence, if it exists, is most likely to be found only in a prospective study monitoring a substantial sample of individuals over a sustained time period.

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TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 NELLIS AIR FORCE BASE HISTORICAL BACKGROUND.	6
2.1 Nellis Air Force Base Historical Overview	6
2.2 Nellis Air Force Base Historical Range and Airspace Overview	7
3.0 SUPERSONIC FLIGHT OPERATIONS WITHIN TFWC RANGE COMPLEX	12
3.1 57th Fighter Weapons Wing.	12
3.2 474th Tactical Fighter Wing	14
3.3 4440th Tactical Fighter Training Group (TFTG) – Red Flag.	14
3.4 Other Data Sources	22
4.0 OTHER OPERATIONS DATA BASES.	24
4.1 Sonic Boom Inquiry Data Base	24
4.2 Sonic Boom Complaint Data Base	27
4.3 Air Combat Maneuver Instrumentation Data Base	27
5.0 SUPERSONIC MANEUVERING AND MODELING	29
5.1 Sonic Boom Characteristics	29
5.2 Simplified Sonic Boom Prediction	37
5.3 Yearly Day-Night Average C-Weighted Sound Level	40
5.4 Sonic Boom Environment Definition	43
6.0 CONCLUSIONS.	61
REFERENCES	69
APPENDIX A Maps of Changes in the Tactical Fighter Weapons Center Range Complex 1968-1983.	71
APPENDIX B Considerations of Focus Booms	79
APPENDIX C Worksheets Defining Estimates of Supersonic Events by Year and Wing from Nellis Air Force Base	83
APPENDIX D Detailed Tabulations of Estimated Sonic Boom Environment by Aircraft Type, Year, and Nevada Township	101

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1-1 General Characteristics of Structural Damage Claims Paid by the Air Force Resulting from Sonic Booms.	2
3-1 Summary of Hours and Sorties Flown for Supersonic Capable Aircraft	13
3-2 Summary of Contents of 57th TFW Operations Data Base for Nellis Air Force Base.	15
3-3 Supersonic Events per Sortie by Aircraft Type for Training Operations of 57th FWW	16
3-4 Summary of Content of 474th TFW Operations Data Base for Nellis Air Force Base.	17
3-5 Summary of Content of Red Flag Operations Data Base for Nellis Air Force Base.	20
3-6 Red Flag Operations.	21
3-7 Supersonic Capable Missions by Area Flown — in TFWC Range Complex.	23
5-1 Average Altitude of Fighter Aircraft During Supersonic Air Combat Maneuvering.	33
5-2 Nominal Sonic Boom Footprint Characteristics for Fighter and SR-71 Aircraft	39
5-3 Representative Calculation of Supersonic Events in the TFWC Range Complex for 1978	45
5-4 Summary of Predicted and Recorded Supersonic Events in the TFWC Range Complex	47
5-5 Relative Percent Distribution of Supersonic Events in the TFWC Range Complex Excluding R4808	49
5-6 TFWC Range Complex Distribution of Supersonic Events from 1983/1984 Sonic Boom Inquiry Report Data Base . . .	51
5-7 Estimated Supersonic Sortie Distribution of Fighter Aircraft by Range/Desert MOA Subdivision for the TFWC Range Complex .	53
5-8 Supersonic Events from Sonic Boom Inquiry Data Base in State of Nevada	54
5-9 Percent Range/Desert MOA Area Subdivisions Within Townships Surrounding TFWC Range Complex.	57

LIST OF TABLES (CONTINUED)

5-10	Supersonic Sortie Distribution for the Years 1969 to 1983 for all Nevada Townships that Fall Partly Within the TFWC Range Complex	58
5-11	Sample Computer Output of Sonic Boom Exposure in the State of Nevada for Tactical Aircraft for 1978	60

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1-1 Predicted Community Response (in Terms of Percentage Highly Annoyed) to Sonic Boom and to Other High-Energy Impulsive Sounds	3
2-1 Tactical Fighter Weapons Center (TFWC) Range Complex (Shaded Area) in the State of Nevada Near Nellis Air Force Base (Indicated by Arrow) Near Las Vegas)	8
2-2 TFWC Range Complex as of 1968	10
2-3 TFWC Range Complex as of 1983	11
3-1 A Typical Red Flag Training Exercise as of 1976	18
4-1 Sample Computer Printout of Data Base Developed from AF Form 121.	25
5-1 Sonic Boom Waveform Generation.	30
5-2 Typical Wideband Pressure Time Waveform of a Sonic Boom Due to a Maneuvering F-15 Aircraft Flying at Mach 1.1, Altitude 5 km, Minimum Slant Range to Microphone 12 km. N-wave duration about 110 ms. Positive peak flat sound pressure 118 Pa (2.5 psf); negative, 123 Pa (2.6 psf)	31
5-3 Sonic Boom Ground-Pressure Patterns — "Carpet Boom"	34
5-4 Air-to-Air Maneuvering Area Showing Sonic Boom Impact Area	35
5-5 Sonic Boom Area and Intensity for Typical F-15 Air Combat Maneuvering	36
5-6 Comparison Between Full-Signature Boom Model, Carlson Far-Field Model, and Current Model	38
5-7 C-Weighted Sound Exposure Level for Sonic Boom N-Waves with a Peak Pressure of 1 psf.	42
5-8 Division of TFWC Range Complex Into 4 Major Divisions (North Range, South Range, R-4809, and Desert MOA) and Their Respective Subdivisions for Which Supersonic Events are Defined	48
5-9 Townships (in Small Letters), Counties (in Large Letters), and TFWC Range Complex in the State of Nevada	56

LIST OF FIGURES (CONTINUED)

6-1	Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft for all Townships in Nevada, for the year 1970	63
6-2	Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft for all Townships in Nevada, for the year 1975	64
6-3	Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft for all Townships in Nevada, for the year 1980	65
6-4	Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft for all Townships in Nevada, for the year 1985	66

GLOSSARY OF TERMS

L_{CE}	C-weighted sound exposure level in decibels (also shown as CSEL).
L_{Cdn}	Day-night average C-weighted sound level in decibels (also shown as CLDN).
L_{CdnY}	Yearly day-night average C-weighted sound level in decibels (also shown as yearly CLDN).
$PC(t)$	The instantaneous C-weighted sound pressure.
P_{ref}	The reference pressure of $20\mu Pa$.
P_{PK}	Peak pressure in pounds per square foot.
N	Number of impulse events for any given year.
A_C	The area of the boom footprint in square miles.
A_T	The total area in which supersonic activity occurs, in square miles.

sound pressure level — In decibels, 20 times the logarithm to the base ten of the ratio of the sound pressure, in a stated frequency band, to the reference sound pressure. The sound pressure is understood to be a time-period, root-mean-square sound pressure, unless another time-averaging process is indicated. For sound in air, the reference sound pressure is 20 micropascals ($20\mu Pa$). Abbreviation: SPL; quantity symbol: L_p .

C-Weighting — The frequency weighting specified as C in ANSI S1.4-1983. C-weighting retains its sensitivity to sounds of frequency between 100 and 1000 hertz, but gradually decreases in sensitivity at frequencies below 100 hertz. At 31.5 hertz, the C-weighting frequency response is 3 decibels below that at 1000 hertz.

sound exposure level — The level, in decibels, of the time integral of squared weighted sound pressure over a given time period or event, with reference to the square of the standard reference sound pressure of 20 micropascals ($20\mu Pa$) and a reference duration of 1 second. The frequency weighting shall be specified, otherwise A-weighting is understood. For C-weighting, the abbreviation is CSEL and quantity symbol is L_{CE} .

day-night average sound level — The level, in decibels, of the 24-hour (midnight to midnight) mean-square weighted sound pressure, obtained after addition of 10 decibels to sound levels in the night from midnight to 7 a.m. and from 10 p.m. to midnight (0000-0700 and 2200-2400 hours). When the day-night average sound level is measured, it is not necessary that the measurement period begin at midnight. The frequency weighting shall be specified, otherwise A-weighting is understood. For C-weighting, the abbreviation is CLDN and the quantity symbol is L_{Cdn} .

yearly day-night average sound level — The day-night average sound level, in decibels, where the time period over which the average is taken is one year. For C-weighting, the quantity symbol is L_{Cdn} .

sortie — A single aircraft operation beginning with a takeoff and ending with a landing.

mission — An operation involving one or more aircraft, each with a specific task to perform.

1.0 INTRODUCTION

Military training operations of supersonic aircraft - a vital part of the Air Force's mission - are carried out throughout the continental United States. Sonic booms generated during these flights have resulted in two reasonably well-defined environmental disbenefits and a poorly defined potential for undesirable health effects.

The well-defined disbenefits of sonic booms are:

- o Structural Response - Normally limited to relatively minor damage, such as window glass breakage or plaster cracking, but on rare occasions (due to unauthorized operations), structural response has extended to relatively severe damage of secondary building structures (see Table 1-1).
- o Annoyance/Complaint Response - A reasonably well-defined tendency for people exposed to sonic booms to register an annoyance response, upon interrogation, or respond voluntarily by complaint¹ (see Figure 1-1).

Operational procedures employed by the U. S. Air Force have generally been successful in coping with public reaction to these defined disbenefits without jeopardizing continuation of supersonic training operations. However, a different situation may exist for potential health effects. The existence of any such marginal effect is inherently very difficult to either verify or disprove. As a result, public reaction to existing or anticipated sonic boom environments from the perspective of perceived or anticipated health effects has been a difficult problem for the Air Force. There is no well-accepted evidence that nonauditory health effects on humans due to sonic boom do, in fact, exist. However, as reviewed in more detail in Volume II of this study, there is a vast body of literature which suggests that such health effects may exist. Thus, the Air Force is now frequently faced with strong and potentially overwhelming reactions by public, private, or legal groups based on their position regarding these potential health effects. The net effect, in some cases, is a serious incompatibility between community responses concerning potential or anticipated health effects and Air Force supersonic training needs. The Air Force has chosen, therefore, to undertake research in this area in order to establish, to the extent possible, whether any significant

Table 1-1

General Characteristics of Structural Damage Claims
Paid by the Air Force Resulting from Sonic Booms⁽¹⁾

1. Test Areas: Chicago, Pittsburgh, Milwaukee
St. Louis, Oklahoma City
St. Louis (second exposure)
2. The number of claims was directly proportional to the number of booms and the number of people hearing each boom.
3. Average claim per 100,000 people per boom varied from 1.2 in Pittsburgh to 0.77 in Oklahoma City. Based on an average of three people per residence, this amounts to about one claim per boom per 30,000 houses.
4. Personal investigation of claims by engineers indicated that five to ten percent of claims reflect true "trigger" effects from sonic booms; therefore, one sonic boom caused one valid damage claim per 300,000 houses, according to this data.
5. For each 100 valid claims, the types of damages break down as follows:

Structural damage	0
Wallboard and nail popping	1
Plaster cracking and crack aggravation	5
Fallen sections of plaster ceiling	10
Bric-a-brac damage	34
Glass window damage	50
- 6) From 1956 to 1970, over \$1.7 million was paid out by the Air Force to settle 37 percent of the 41,617 claims made, resulting in an average payment per claim of \$112.

(1) Based on information furnished by Engineering Services, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio. The data for items 1-5 are mostly from B-58 overflights during the 1960's with mean peak overpressures of about 1.7 psf (altitude 42,500 ft.).

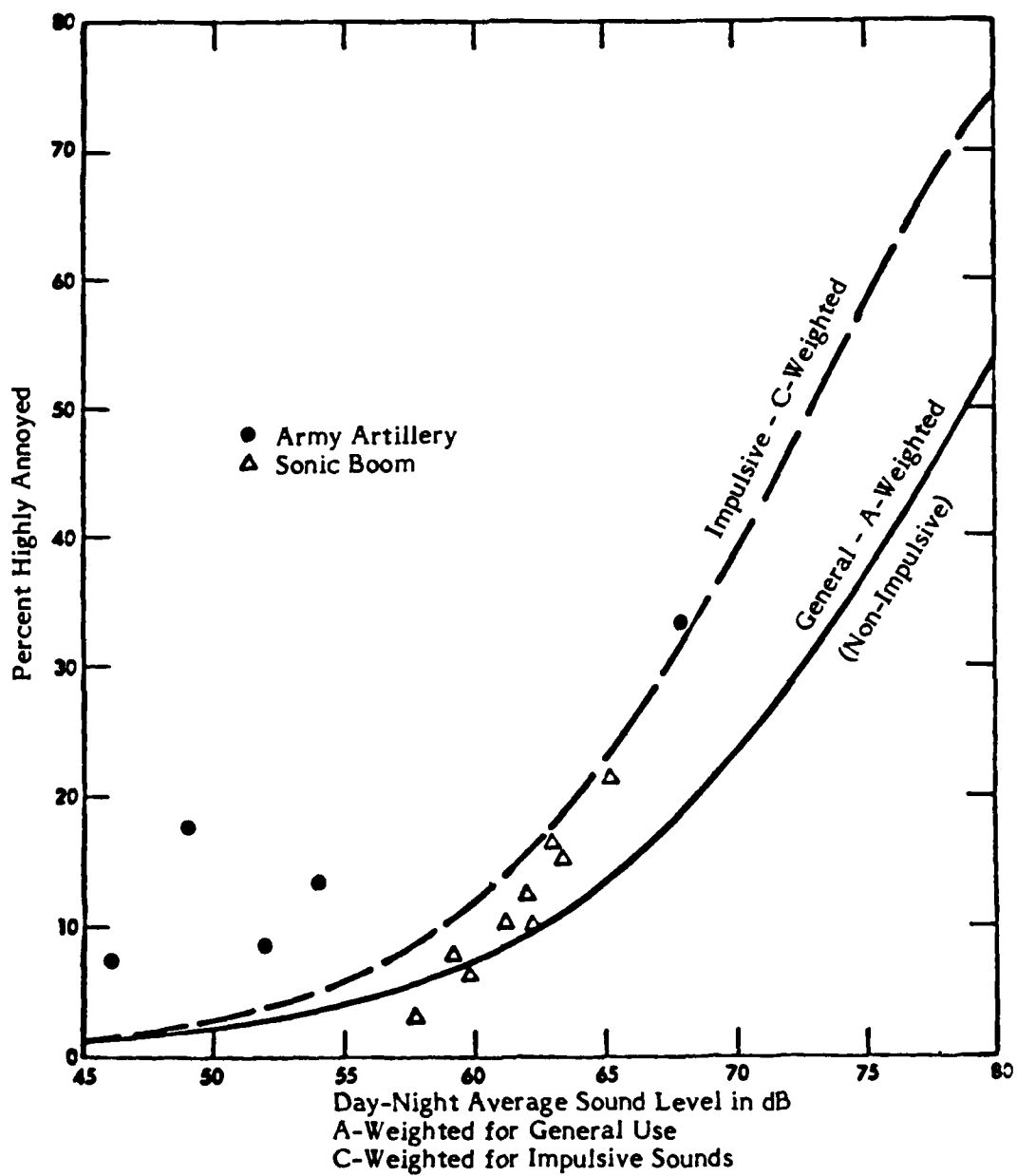


Figure 1-1. Predicted Community Response (in Terms of Percentage Highly Annoyed) to Sonic Boom and to Other High-Energy Impulsive Sounds (from Reference 1)

health effects on humans can, in fact, be attributed to sonic booms resulting from supersonic training flights.

The program described in this report represents just one part of this planned research. The study was designed to evaluate potential health effects of sonic booms through a retrospective evaluation of exposure and health data for people living near the Tactical Fighter Weapons Center (TFWC) Range Complex, close to Nellis Air Force Base, Nevada. This site, which includes the so-called Desert Military Operations Area (MOA), was selected by the Air Force for this study since it has been exposed to sonic booms for a longer period of time than any other area in the United States. While emphasis is placed in this volume on estimating the sonic boom environment within the TFWC Range Complex, it was desirable to extend the estimates of sonic boom environment to cover the entire State of Nevada, to be consistent with the comparable state-wide health effects data base.

The program has been divided into two parts. The first part, reported in this volume, has attempted to establish the history of the sonic boom environment in the TFWC Range Complex from 1969 through 1983. Although supersonic event estimations could have been constructed as far back as 1955, a start date of 1969 was consistent with practical start dates for medical record acquisition and for the DOD computer data base on supersonic operations described in Section 4.1. The second part, a retrospective epidemiological study, was carried out by the Department of Community and Environmental Medicine, School of Medicine, University of California, Irvine, and is reported in Volume II.

The reconstruction of supersonic flight activity was based on reviews of:

- o historical records of supersonic capable aircraft operating from Nellis Air Force Base
- o environmental impact reports
- o computerized records of supersonic flight activity throughout the State of Nevada
- o training syllabi
- o discussions with training instructors and other base personnel

Reasonable estimates of total operations have been determined within the constraints of the availability of these historical data.

Section 2 of this report contains an overview of the history of the use of the TFWC Range Complex by Nellis Air Force Base. Sections 3 and 4 describe the data bases utilized to assemble the flight operations data from Nellis Air Force Base, and from other sources, respectively. Section 5 presents estimates of the supersonic operations and the sonic boom modeling, and details the estimates of the sonic boom environment within the TFWC Range Complex and the State of Nevada. Section 6 presents the conclusions from this volume.

Appendix A contains TFWC Range Complex charts which show how the ranges and the Desert MOA have developed since 1968. Appendix B discusses the characteristics of focus booms. Appendix C contains a complete set of worksheets used to estimate the number of sonic boom events per year from 1969 through 1983, throughout the State of Nevada. Appendix D presents the estimated yearly sonic boom environment for the State of Nevada by township for the years 1969 through 1983.

2.0 NELLIS AIR FORCE BASE HISTORICAL BACKGROUND

This section presents a brief historical overview of Nellis Air Force Base and specific range histories for the time periods for which pertinent flight operations data are available.

2.1 Nellis Air Force Base Historical Overview

On January 25, 1941, the City of Las Vegas signed over the property to the U. S. Army Quartermaster Corps for the development of a flexible gunnery school for the Army Air Corps.² Originally known as the Las Vegas Army Air Corps Gunnery School, the base later acquired the name Las Vegas Army Air Field.

In 1942, the base was expanded and the first B-17s arrived. In March 1945, the base was converted from B-17s to B-29s and became the B-29 Gunnery School. A deactivation order closed the base on July 31, 1945, but a new order put the field on a standby status until January 31, 1947, when it was deactivated. Upon reactivation in 1949 as the Las Vegas Air Force Base, it became the home for a pilot training wing.

In 1952, the 3595th Training Wing began flight training with the first potentially supersonic aircraft - the F-86. However, the first significant supersonic operations did not start until 1955 when the first of the century series fighter aircraft, the F-100, was introduced. In 1956, the first supersonic flight operations area was defined. It consisted of a range 15 miles wide by 40 miles long, east of the old Gunnery Range.

In July 1958, the Tactical Air Command (TAC) took over operational control of Nellis. Designed to fit TAC's theme of "Any Time, Any Place," the Nellis Air Force Base's major missions are Operational Test and Evaluation of current Tactical Fighter Weapon Systems, the training of instructor pilots in Tactical Fighter Weaponry, and the training of air crews in the operation and employment of advanced Tactical Fighter Weapons Systems.

F-86 flight training was phased out entirely by 1966 and was replaced by flight training activity with F-100 aircraft (starting in 1955), F-105 aircraft (starting in 1960), and F-4 aircraft (starting in 1962). During 1966, Nellis and the flying school underwent a major reorganization. TAC created a new U. S. Air

Force Tactical Fighter Weapons Center (USAF TFWC), as the central authoritative agency in all matters pertaining to the deployment of USAF Tactical Fighter Forces worldwide.³

On March 20, 1968, the 474th Tactical Fighter Wing (TFW) was transferred to Nellis Air Force Base. The mission of the 474th TFW is to be combat ready and capable of deployment anywhere in the world.

On October 15, 1969, the 57th Fighter Weapons Wing (FWW) was activated at Nellis. The USAF Fighter Weapons School trains tactical fighter personnel as instructors in the latest tactics, techniques, and operation of fighter weapons systems, subsystems, and equipment, including the operation of tactical electronic warfare systems, and it conducts tests and evaluation of tactical fighter weapons systems as directed by the USAF TFWC.

On March 1, 1976, the 4440th Tactical Fighter Training Group (TFTG) was activated at Nellis Air Force Base to simulate enemy forces in combat training during large scale training exercises called Red Flag. On October 1, 1979, the USAF TFWC began to reorganize. Under the new plan, the 57th FWW took over responsibility for all flying related functions including the 4440th TFTG (Red Flag).

In summary, flight operations in the TFWC Range Complex are currently carried out, out of Nellis Air Force Base, by three separate but coordinated activities of the 57th FWW, the 474th TFW, and the 4440 TFG. A relatively small number of additional military flight operations also occur in the TFWC Range Complex as a result of activities by the U.S. Navy and during other military preparedness exercises.

2.2 Nellis Air Force Base Historical Range and Airspace Overview

The TFWC Range Complex, located in the southern part of Nevada with a minor segment falling within the State of Utah, as illustrated in Figure 2-1, is composed of the Desert Military Operating Area (MOA) with its overlying Air Traffic Control Assigned Airspace and adjacent restricted range lands. In general, since 1968 the Nellis ranges have comprised approximately three million acres of land within the bounds of restricted areas designated by R4806, R4807, R4808, and R4809. These restricted ranges have essentially maintained their size, shape and usage during the time period considered in this report (1969 to 1983).

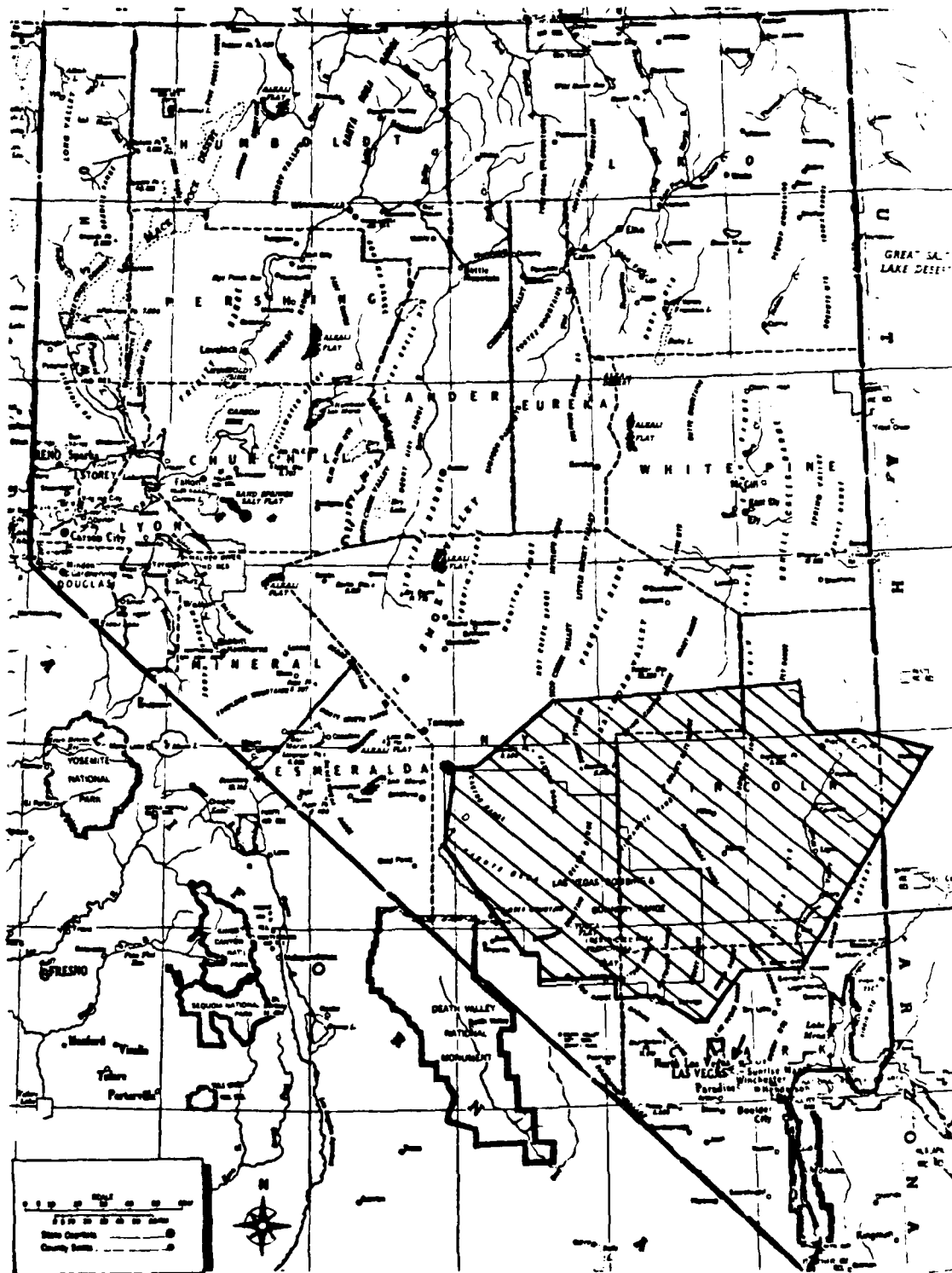


Figure 2-1. Tactical Fighter Weapons Center (TFWC) Range Complex (Shaded Area) in the State of Nevada Near Nellis Air Force Base (Indicated by Arrow) Near Las Vegas

Ranges R4806 and R4807 are the Air Force portions of the site and are specially equipped for the conducting of normal air-to-air and air-to-ground training, electronic warfare and operational testing and evaluation, with or without discharge of live or inert ordnance.

Ranges R4808 and R4809 are managed by the Department of Energy (DOE) formerly the Energy Research and Development Administration (ERDA) and the Atomic Energy Commission (AEC). Limited joint usage of R4809 ranges is provided through letters of agreement with the Department of Energy. Normal training and testing operations are prohibited on R4808. However, limited overflights of certain units are permitted in order to maintain a transition area for travel to and from the TFWC North Ranges.⁴

The Desert MOA consists of the airspace over the eastern half of the TFWC Range Complex that also falls outside of restricted airspace. This airspace is over nonrestricted areas and, although its usage has remained relatively consistent, the overall shape of the airspace, the number and the names of the subdivisions and their sizes have changed a great deal. Air-to-air combat missions without discharges of either live or inert ordnance including electronic warfare or surface-to-air missiles (SAM) suppression can occur in this nonrestricted airspace.

Figures 2-2 and 2-3 show the TFWC Range Complex as it was in 1968 and 1983. These figures show the overall changes occurring in the last 15 years. Although the Desert MOA has encompassed much the same area throughout this period, the subdivisions have changed from just two (Caliente 1 and 2) in 1968, to six (Coyote, Cedar, Caliente, Alamo, Elgin and Reveille) in 1983.

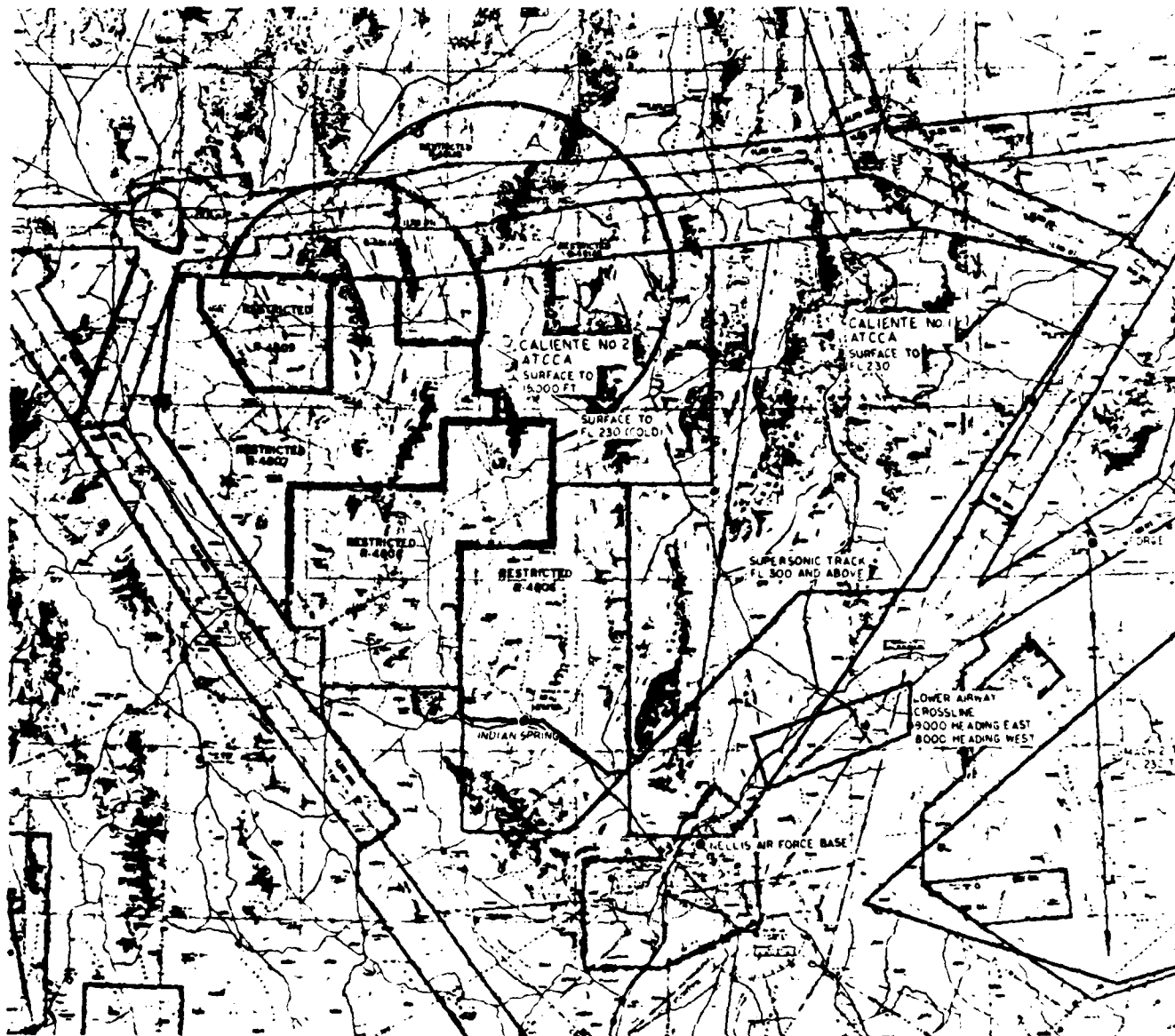


Figure 2-2. TFWC Range Complex as of 1968 (from Reference 2)

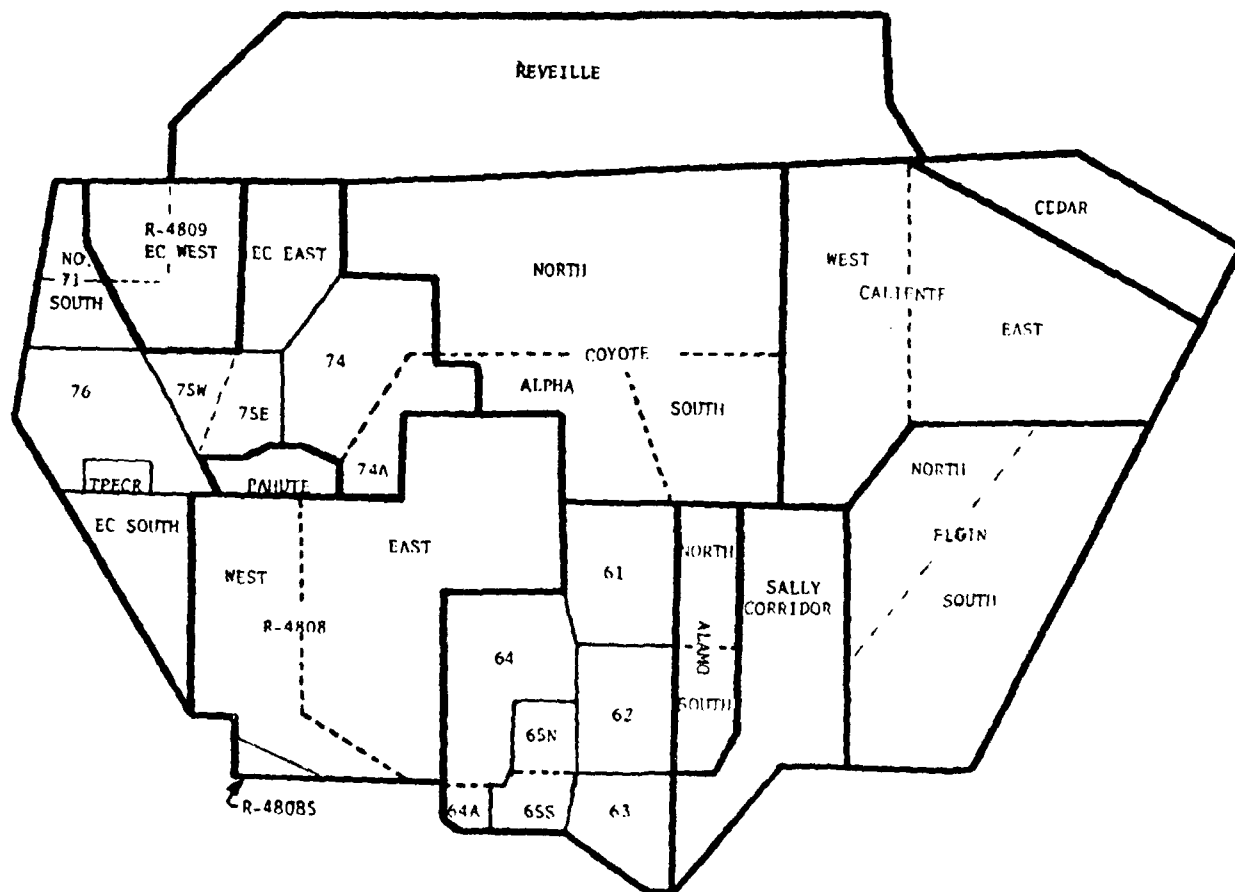


Figure 2-3. TFWC Range Complex as of 1983 (from Reference 4)

3.0 SUPERSONIC FLIGHT OPERATIONS WITHIN TFWC RANGE COMPLEX

As will become evident later in this report, supersonic flight operations in Nevada are strongly dominated by operations within the TFWC Range Complex originating from Nellis Air Force Base. These operations are therefore analyzed in considerable detail in this section. Data relating to supersonic flights outside the TFWC Range Complex are considered in Section 4.

Flight operations data were obtained from two wings: the 57th Fighter Weapons Wing (FWW), the 474th Tactical Fighter Wing (TFW), and one group under the responsibility of the 57th FWW - the 4440th Tactical Fighter Training Group (TFTG), also known as Red Flag. Only operations of supersonic capable aircraft were examined, since only sonic boom environments were of concern.

The primary data collected consisted of number of hours flown and number of sorties flown. However, data concerning aircraft training syllabi, average aircraft processed, range distribution, and range description were also collected. Data provided in various formats including text, tables, and figures were scattered throughout a large number of historical range documents. Furthermore, data for specific time periods varied considerably, including aggregation by fiscal year, calendar year, month, quarter, and biannual periods. Ultimately all operations data were collected into calendar years.

Table 3-1 summarizes the data obtained from the 57th FWW, the 474th TFW and Red Flag, on sorties and hours flown from 1969 through 1983. Those data for 57th FWW and 474th TFW operations which are normally recorded as Red Flag operations have been subtracted, so that they would not be counted twice.

Operations data for flight testing and special flight routines were not available. Therefore, after discussions with Nellis Air Force Base personnel, an additional 10 percent of the recorded yearly sorties was added to each year, to account for this additional undocumented activity.

3.1 57th Fighter Weapons Wing

The current mission of the USAF TFWC is to perform operational tests and evaluations of tactical fighter weapons systems. It is also responsible for training fighter pilots as experts in their particular weapons systems and is responsible for assisting in the definition of future tactical fighter weapons systems requirements.

Table 3-1

Summary of Hours and Sorties Flown for Supersonic Capable Aircraft

Year	57th FW		474th TFW		4440th TFTG Red Flag (1)		Subtotal		Total (2)	
	Hours Flown	Sorties Flown	Hours Flown	Sorties Flown	Hours Flown	Sorties Flown	Hours Flown	Sorties Flown	Hours Flown	Sorties Flown
1969	18335	14658	33547	12833			51882	27491	57070	30240
1970	14807	11734	7545	3153			22352	14887	24587	16376
1971	14787	11708	23771	11144			38558	22852	42414	25137
1972	12682	10217	23426	8699			36108	18916	39719	20808
1973	15628	13174	13132	5097			28760	18271	31636	20098
1974	16209	14519	12251	4759			28460	19278	31306	21206
1975	14687	13476	10680	4808	461	382	25828	18666	28411	20533
1976 (3)	15075	15725	18047	7973	5756	4247	38878	27945	42766	30740
1977 (3)	19437	20760	13166	6651	10782	7463	43385	34874	47724	38361
1978	18447	19572	12830	10217	10415	7590	41692	37379	45861	41117
1979	19175	20061	13759	10647	11432	7715	44366	38423	48803	42265
1980	19941	20999	13044	10657	8408	5676	41393	37332	45532	41065
1981	21347	22034	16289	12357	11668	8033	49304	42424	54234	46666
1982	22219	22186	22204	15180	11797	7908	56220	45274	61842	49801
1983	24099	23756	21402	14859	11420	7774	56921	46389	62613	51028

(1) 57th FW and 474th TFW operations are not included in Red Flag data

(2) Includes 10% of subtotals to account for testing and special routines.

(3) Does not include ACEVAL/AIMVAL operations

Operations data for the 57th FWW were obtained primarily through the investigation of historical records provided by the base historian. Historical records from 1955 through 1983 were reviewed. Table 3-2 provides a chronological history of the data collected and aircraft flown by the 57th FWW. Although some years have missing data, enough information was gathered to make reasonable approximations of missing data for the final analysis.

Another source of information which proved to be extremely important in the determination of the number of supersonic events per sortie were Instructor Course Outlines.⁵⁻¹¹ From the outlines and discussions with flight instructors, estimates of the average number of supersonic sorties executed during air-to-air combat flight training for a specific aircraft type were established. These data are shown in Table 3-3. Nellis Air Force Base flight training personnel stated that this type of flight activity represents 75 percent of the 57th FWW operations. These data were submitted to appropriate airspace management personnel at Nellis Air Force Base for review and were considered to be reasonable and accurate.¹² As a result of this review the initial data base developed by Wyle was changed to reflect minor changes for the F-15 aircraft. This modification did not have a major impact on the magnitude of the calculated sonic boom exposure levels.

3.2 474th Tactical Fighter Wing

The mission of the 474th TFW is to execute directed tactical fighter missions designed to destroy enemy forces, supplies, equipment, communications systems, and installations with suitable weapon systems and when appropriate, provide replacement training of combat aircrews and maintenance personnel, in accordance with prescribed training syllabi.

Operations data for the 474th TFW were provided by the 474th TFW historian. This data base was virtually complete from 1968 to 1983, as shown in Table 3-4.

3.3 4440th Tactical Fighter Training Group (TFTG) -- Red Flag

Red Flag exercises are scenarios of simulated combat conditions, in which aircraft are confronted with enemy electronic warfare radar, various types of missile and anti-aircraft artillery, and aggressor aircraft threats. To stage the offensive, various types of aircraft support the primary deployed units. A representative Red Flag mission is depicted in Figure 3-1.¹³

Table 3-2

Summary of Content of 57th TFW Operations Data Base for Nellis Air Force Base

Calendar Year	57th TFW Operations Data *			Operations Data by Aircraft Type *								
	Avg. # of Aircraft	Hours Flown	Sorties Flown	<u>F4</u>	<u>F5</u>	<u>F15</u>	<u>F16</u>	<u>F86</u>	<u>F100</u>	<u>F105</u>	<u>F111</u>	<u>T38</u>
1955	4	4						4	4			
1956	4	4						4	4			
1957	2	2						4	4			
1958	3	3						1	4			
1959	4	4	2						4			
1960	4	4	4						4	2		
1961	4	4	4						4	4		
1962	4	4	1						4	4		
1963	4	4	4					4	4	4		
1964	4	4	4					4	4	4		
1965	4	4	2	2				4	4	4		
1966	4	4	4	4				2	4	4		
1967	4	4	4	4					4	4		
1968	4	4	2	4					4	4		
1969	4	4		4						4		
1970	4	4		4						4		
1971	4	4		4						4		
1972	3	2		4						4	2	3
1973	3	2		4						4	4	4
1974	4	4		4						4	4	4
1975	4	4		4						4	4	4
1976	4	4		4	4	1				4	4	3
1977	4	4		4	4	4				4		
1978	4	4		4	4	4				4		
1979	2	4		4	4	4				2		
1980	4	4		4	4	4	1					
1981	4	4		4	4	4	4					
1982	4	4		4	4	4	4					
1983	4	4		4	4	4	4					

*/ Number signifies the number of quarters for which data are available.

Table 3-3

Supersonic Events per Sortie
by Aircraft Type for Training Operations of 57th FW⁽¹⁾

<u>Aircraft Type</u>	<u>Supersonic Events Per Sortie ⁽²⁾</u>
F4	0.23
F5	0.38
F15	0.43
F16	0.24
F100	0.14
F105	0.40

(1) From estimations by USAF instructors and TAC training syllabi for each aircraft

(2) Supersonic events per sortie for aircraft flight training

Table 3-4

Summary of Content of 474th TFW Operations Data Base for Nellis Air Force Base

Calendar Year	474 TFW Operations Data *			Operations Data by Aircraft Type *								
	Avg. # of Aircraft	Hours Flown	Sorties Flown	<u>F4</u>	<u>F5</u>	<u>F15</u>	<u>F16</u>	<u>F86</u>	<u>F100</u>	<u>F105</u>	<u>F111</u>	<u>T38</u>
1968	2	2	2								2	
1969	4	4	4								4	
1970	4	4	4								4	
1971	3	4	4								4	
1972	4	4	4								4	
1973	4	4	4								4	
1974	4	4	4								4	
1975	4	4	4								4	
1976	4	4	4								4	
1977	4	4	4	3							2	
1978	4	4	4	4								
1979	4	4	4	4								
1980	4	4	4	4			1					
1981	4	4	4	3			4					
1982	4	4	4				4					
1983	4	4	4				4					

*/ Number signifies the number of quarters for which data are available.

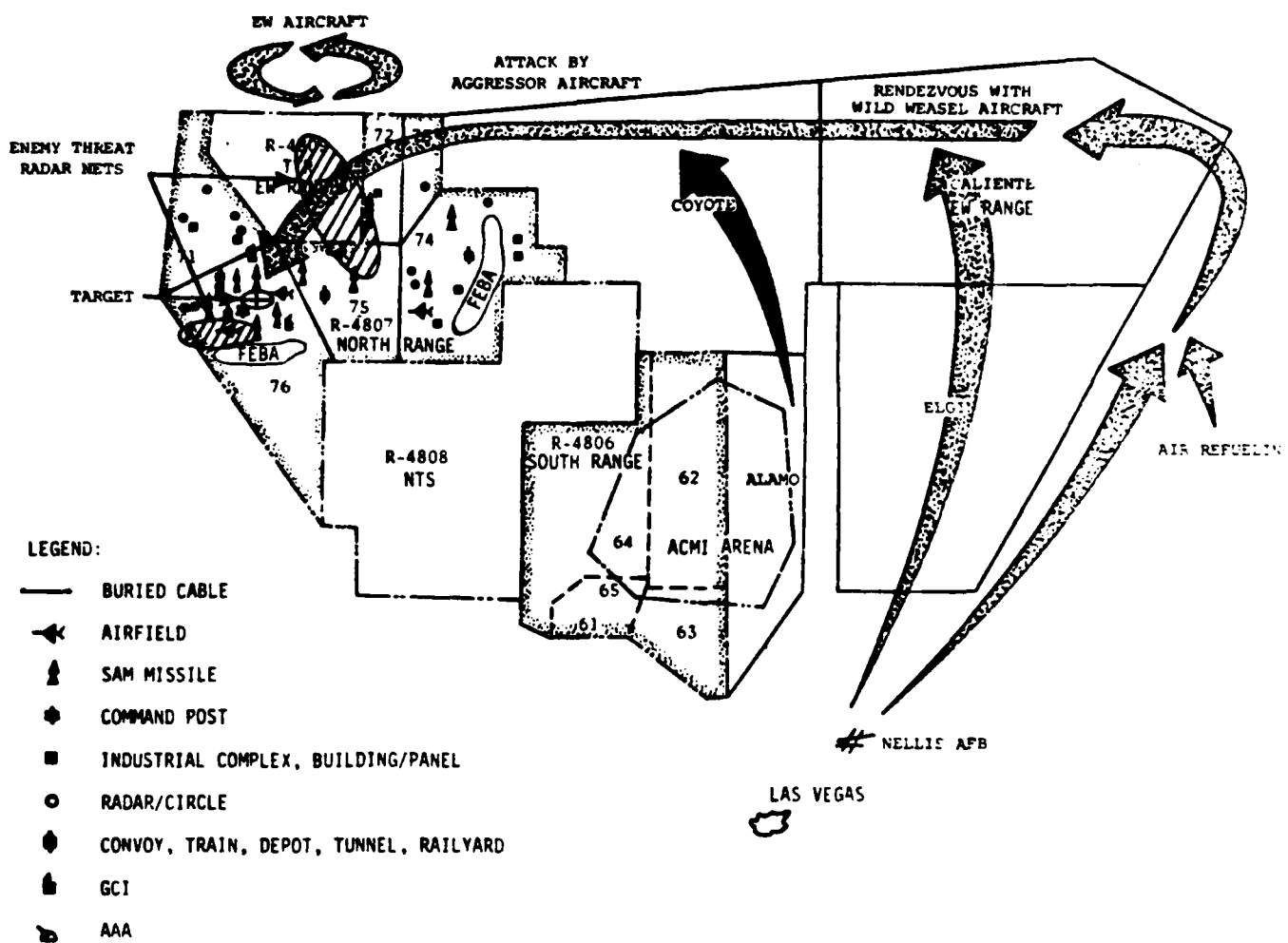


Figure 3-1. A Typical Red Flag Training Exercise as of 1976 (from Reference 13)

Based on discussions with Nellis Air Force Base personnel, the type of supersonic flight activity carried out during Red Flag operations was typical of the remaining 25 percent of the 57th FWW operations and typical of 100 percent of the 474th TFW and 440th TFTG (Red Flag) operations.

Operations data for Red Flag were obtained in computer output form from operations personnel attached to the 4440th TFTG. Operations data were shown for each Red Flag exercise by squadron, wing, aircraft type, sorties, and hours flown.

The data for the 57th FWW and the 474th TFW were compiled separately and were subtracted from the wing totals so that the data would not be counted twice. Data were complete in terms of Red Flag exercises, but some data concerning aircraft type and number of hours or sorties flown were missing. See Table 3-5.

For the calendar year 1983, Red Flag also had a data base of supersonic flight by aircraft type, Mach number, altitude, and by exercise. This information was compared to the total number of sorties flown to estimate supersonic events per sortie, as shown in Table 3-6. These initial estimates were reviewed by Nellis Air Force Base personnel and were found to be reasonable and accurate except for two aircraft: the F-14 and the F-18.¹² The supersonic events per sortie for these aircraft were therefore changed to 0.35 and 0.30 respectively. Because these aircraft are not part of the 57th or 474th possessed aircraft, this change does not impact the magnitude of the estimated sonic boom environment levels because of the limited number of sorties per year for these aircraft.

In summary, supersonic events per sortie for the tactical fighter aircraft stationed at Nellis Air Force Base fell into two groups.

- o The air-to-air (combat) training flights for the 57th FWW — listed by aircraft type in Table 3-3. (These operations constituted 75 percent of sorties by 57th FWW aircraft.)
- o Red Flag-type simulated combat flights carried out for all other sorties — listed by aircraft type in Table 3-6.

Table 3-5

Summary of Content of Red Flag Operations Data Base for Nellis Air Force Base

<u>Calendar Year</u>	<u>Red Flag Exercises</u>	<u>Hours Flown</u>	<u>Sorties Flown</u>	<u>Operations Data by Aircraft Type</u>										
				<u>F4</u>	<u>RF4C</u>	<u>F5</u>	<u>F14</u>	<u>F15</u>	<u>F16</u>	<u>F100</u>	<u>F104</u>	<u>F105</u>	<u>F106</u>	<u>F111</u>
1975	75-1	X	X	X	X	X								
1976	76-1/76-7	X	X	X	X	X		X		X		X	X	X
1977	77-1/77-10	X	X	X	X	X	X	X		X		X	X	X
1978	78-1/78-9	X	X	X	X	X		X		X	X		X	X
1979	79-1/79-4	X	X	X	X	X	X	X		X			X	X
1980	80-1/80-4	X	X	X	X	X		X	X			X	X	X
1981	81-1/81-5	X	X	X	X	X		X	X			X	X	X
1982	82-1/82-5	X	X	X	X	X		X	X		X		X	X
1983	83-1/83-5	X	X	X	X	X	X	X	X			X	X	X

Table 3-6

Red Flag Operations ⁽¹⁾

<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Hours Flown</u>	<u>Hrs/Sortie</u>	<u>Recorded Supersonic Events</u>	<u>Supersonic Events per Sortie</u> ⁽²⁾
F4	4847	6893	1.4	136	0.03
RF4C	955	1140	1.2	20	0.02
F5	240	327	1.4	8	0.03
F14	48	74	1.5	1	0.35 ⁽³⁾
F15	2816	4199	1.5	601	0.21
F16	1437	1376	1.0	47	0.03
F18	357	631	1.8	28	0.30 ⁽³⁾
F106	270	383	1.4	62	0.23
F111	801	1494	1.9	152	0.19
TOTAL: 11,771				1,055	
Weighted Mean:					0.09 ⁽⁴⁾

(1) From Red Flag Data Base 6-82 through 12-83

(2) Supersonic events per sortie for simulated combat training operations

(3) The data for the F-14 and F-18 were revised from initial estimates based on a review by Nellis Air Force Base personnel.

(4) Weighted mean supersonic events per sortie equals the supersonic events recorded in Red Flag operations data base divided by total Red Flag sorties flown.

3.4 Other Data Sources

The base historian at Nellis Air Force Base also provided several other documents which helped to establish trends and general information which was used to calibrate the data base. These elements included Environmental Impact Statements, Range and Continental Operating Range (COR) Management Plans, TAC course syllabi and other similar operations background material.¹³⁻¹⁸

These documents and discussions with Nellis Air Force Base personnel were particularly helpful in determining where particular kinds of supersonic capable missions were flown within the TFWC Range Complex. Table 3-7 summarizes this information.

Table 3-7

Supersonic Capable Missions by Area Flown - in TFWC Range Complex /1

<u>Mission</u>	<u>Description</u>	<u>Range Area</u>							
		ALAMO	CALIENTE	COYOTE	EC SOUTH	ELGIN	4806	4807	4809
TACTICAL FIGHTER WEAPONS CENTER									
ACM	Air Combat Maneuvers	x							
ACT	Air Combat Tactics	x				x	x		
AHC	Aircraft Handling Combat	x				x	x		
BFM	Basic Fighter Maneuvers	x	x			x	x		
DACT	Dissimilar Air Combat Training	x	x			x	x		
EACT	Enemy Air Combat Training	x	x				x		
ME	Mission Employment		x				x		
SA	Surface Attack	x						x	x
TI	Tactical Intercepts	x	x			x	x		
RED FLAG									
ADF	Air Defence Force								
BAI	Battlefield Area Interdiction		x					x	
CAP	Combat Air Patrol							x	
ECM	Electronic Countermeasures		x					x	
HKR	Hunter/Killer								
INT	Interdiction								
OCA	Offensive Counter Air								x
REC	Reconnaissance		x						x
SED	Suppression of Enemy Air Defenses		x						
									x

1/ From Nellis AFB personnel

4.0 OTHER OPERATIONS DATA BASES

Three other data bases were available to estimate the supersonic environment throughout the State of Nevada.

- o Sonic Boom Inquiry Data Base
- o Sonic Boom Complaint Data Base
- o Air Combat Maneuver Installation (ACMI) Data Base

4.1 Sonic Boom Inquiry Data Base

The Sonic Boom Inquiry Data Base is maintained by the Air Force as a computer retrievable record of supersonic events from 1968 to the present throughout most of the Continental United States. These records are based on several sources, including reports filed on Air Force Form 121 (Sonic Boom Inquiry Reports) required from all flight crews undertaking supersonic operations. The records contain coordinates, altitude, and flight parameters for each supersonic event. A sample printout of the data base contents is shown in Figure 4-1, which lists a portion of the full record of all the supersonic events within a user-specified radius centered on a user-specified location within the user-specified time period. The closed box shows how a particular flight path of one SR-71 aircraft is defined. Note that supersonic events for fighters are much shorter, and are typically described only by the start and end points.

The Sonic Boom Inquiry data obtained for this study were broken down into two main categories: supersonic events for fighter aircraft and for SR-71 aircraft. The supersonic events for all fighter aircraft were grouped into one category for this report since the variation in supersonic flight paths and estimated sonic boom levels on the ground did not differ among fighter aircraft over a sufficient range to justify any further breakdown in environmental estimate by fighter aircraft type. For the initial estimates of sonic boom environments, these data were subdivided by year, and by intervals of longitude, latitude, altitude and Mach number. Although this data base is not always accurately maintained for routine training flights operating out of Nellis Air Force Base within the designated Desert MOA, and the completeness of reporting is extremely variable for fighter aircraft in general, there are several reasons why it has been used in this study.

- o There is reason to believe that the fighter aircraft supersonic operations recorded in the Sonic Boom Inquiry Data Base are reasonably

010404 0114 03 USAF PENTAGON

VIA (LFEVX)

LOCATION 28 DEGREES 50 MINUTES NORTH LATITUDE AND 082 DEGREES 30 MINUTES WEST LONGITUDE
 TIME-DATE 0001 115 ON 01 OCT 82 FROM 2100 HRS ON 28 FEB 83
 SEARCH RADIUS 240 MILES

DATE	START	1ST TURN/TERM	2ND TURN/TERM	3RD TURN/TERM	MACH	ALT	ACFT	SERIAL	REPORTING	QRT
YY MM DD	TIME N LAT W LON	TIME N LAT W LON	TIME N LAT W LON	TIME N LAT W LON	MIN	THS	WINDS	NUMBER	BASE	AGY
82 10 07	1355 2828 08805	1357 2810 08713	1359 2759 08629	1401 2751 08554	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1401 2751 08554	1403 2745 08529	1405 2740 08509	1407 2731 08451	30	80	SR071A	617979	HEALE	AFB A
82 10 07	1407 2731 08451	1409 2723 08434	1411 2719 08417	1413 2720 08358	30	80	SR071A	617979	HEALE	AFB A
82 10 07	1413 2720 08358	1415 2721 08340	1417 2722 08321	1419 2723 08303	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1419 2723 08303	1421 2721 08244	1423 2707 08236	1425 2651 08229	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1425 2651 08229	1427 2635 08222	1429 2619 08214	1431 2602 08208	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1431 2602 08208	1433 2554 08224	1435 2549 08245	1437 2542 08311	30	80	SR071A	617979	HEALE	AFB A
82 10 07	1437 2542 08311	1439 2535 08340	1441 2525 08413	1443 2512 08451	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1443 2512 08451	1445 2432 08512	1542 2407 08435	1544 2501 08501	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1500 3300 07910	1510 3250 07815	1520 3340 07810	1530 3340 07830	13	41	F016A	079364	SHAW	AFB A
82 10 07	1500 3300 07910	1510 3250 07815	1520 3340 07810	1530 3340 07830	13	41	F016A	080486	SHAW	AFB A
82 10 07	1544 2501 08501	1546 2554 08526	1548 2647 08552	1550 2740 08619	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1550 2740 08619	1552 2828 08644	1554 2903 08709	1556 2917 08742	30	80	SR071A	617979	BEALE	AFB A
82 10 07	1740 2707 08327	1741 2706 08327			12	14	F016A	790415	MACDILL	AFB A
82 10 08	1315 3037 08601	1319 3010 08452			13	42	F104H	790536	TYNDALL	AFB A
82 10 08	1630 2734 08355	1635 2734 08355			12	10	F016A	790350	MACDILL	AFB A
82 10 08	1630 2734 08355	1635 2734 08355			12	10	F016A	800508	MACDILL	AFB A
82 10 08	1733 3130 08025	1734 3100 08040			11	42	F034E	680439	WOODY	AFB A
82 10 10	1537 3114 08434	1542 3224 08252			15	42	F015C	780477	WHITINS	AFB A

* Data from one sortie

Figure 4-1. Sample Computer Printout of Data Base Developed from AF Form 121

accurate for training flights within the TFWC Range Complex for the calendar year 1977. The supersonic events for this year derived from the Sonic Boom Inquiry Data Base, and independently from the Nellis Air Force Base operations data discussed in the previous section, were found to agree very well. This was consistent with information provided by the Air Force to the effect that a very concerted effort had been made in 1977 to maintain accurate records in the Sonic Boom Inquiry Data Base.

- o It was reasonable to assume that any errors in Nellis Air Force Base fighter aircraft supersonic operations in the Sonic Boom Inquiry Data Base would be randomly distributed over the TFWC Range Complex. Thus, this data base was considered to be a reliable estimation of relative spatial distribution of supersonic flight operations within the range for all the study years. For the supersonic operations of fighter aircraft outside the TFWC Range Complex within the State of Nevada, the Sonic Boom Inquiry Data Base was used as the only source available to define both the absolute number and the spatial distribution of such operations. However, they apparently represent a relatively small percentage (estimated to be about 1 to 2 percent from 1974 to 1984) of the supersonic operations of fighter aircraft within the TFWC Range Complex.
- o The data base also contains information on supersonic flight operations of SR-71 aircraft which are very complete. For these aircraft, the data acquisition process is semi-automatic, involving automated reading of data collected on the aircraft's flight recorder. SR-71 flight operations data are not readily available from other sources.

In summary, the Sonic Boom Inquiry Data Base provided what is believed to be a reliable estimate of sonic boom exposure for the entire State of Nevada for SR-71 aircraft. It also provided reasonable estimates of the relative spatial distribution of sonic boom exposure for fighter aircraft operations within the TFWC Range Complex. (As discussed in the next section, an independent quantitative estimate of supersonic fighter aircraft operations within the TFWC Range Complex agreed reasonably well with the data from the Sonic Boom Inquiry Data Base.) The data base was also used as the only available data source for estimating the relatively

small number of supersonic fighter aircraft operations outside the TFWC Range Complex.

4.2 Sonic Boom Complaint Data Base

A tabulated collection of the Sonic Boom Complaint Data was provided to Wyle by Nellis Air Force Base personnel for the years 1983 and 1984.¹⁹ The data contained records of actual complaints and/or claims which were subsequently investigated. However, these data were not utilized for several reasons: a) no complaint data were available for other years, b) complaint records are not considered a reliable estimate of actual sonic boom exposure, and c) for the years 1983 and 1984 combined, only 38 complaints or claims were related to sonic booms. This was not considered to be a reliable estimate of the actual number of booms experienced by residents near the TFWC Range Complex.

4.3 Air Combat Maneuver Instrumentation Data Base

The Air Combat Maneuver Instrumentation (ACMI), a multi-target radar data acquisition system, contains information on supersonic flights within a small portion of the Desert MOA (part of Range R4806 and Alamo). ACMI provides records of aircraft flight parameters at 100 to 200 millisecond intervals of one to four aircraft during air combat maneuver exercises. Data are stored on digital tape, and are played back on a video display as part of the pilot debriefing after training flights. Data include position, velocity, acceleration, angular rates, attitude, altitude, etc.

A limited portion of these data were statistically analyzed by Galloway²⁰ to obtain distributions of altitude, Mach number and location. This data analysis provides one basis for estimating sonic boom exposure within a confined air combat maneuvering (ACM) area. The resulting predicted sonic boom environment was described by Galloway²⁰ in the form of elliptical contours based on the statistical distribution of supersonic flight segments within a given ACM training area. Had the current study been concerned only with a correlation between sonic boom exposure and health effects data for such a very limited area, this contour approach would have been useful for predicting the sonic boom exposure. However, this program required acquisition and processing of a much broader data base covering the entire State of Nevada, so that the elliptical contour approach for

defining sonic boom exposure was considered inappropriate. Furthermore, a recent very limited attempt to validate this contouring concept²¹ has indicated that while the elliptical shape of the contours may be reasonable to describe sonic boom environments for an ACM area, absolute values of the previously predicted sonic boom levels may be excessive.

5.0 SUPERSONIC MANEUVERING AND MODELING

During supersonic flight, a coherent wave pattern of compressed air is created which moves with the aircraft. This can be heard and felt as a sudden impulse noise and is called a "sonic boom." Figure 5-1 shows a simplified drawing of the pressure wave generated by a body in supersonic flight. Near the aircraft there is an acoustic disturbance with a complex shape directly related to the geometry of the aircraft. The pressure signature as recorded on the ground is referred to as an "N-wave" because of its characteristic shape. Figure 5-2 illustrates the physical nature of a typical sonic boom "N-wave" pressure time history.²²

5.1 Sonic Boom Characteristics

As indicated in the previous section, there are two types of operation of interest: high altitude supersonic flights performed by the SR-71, and air combat maneuvering training exercises performed by supersonic fighters.²³

High altitude training SR-71 flights are conducted throughout the Nevada area and have been generally restricted to altitudes greater than 30,000 ft. Acceleration to supersonic speeds can occur in level flight or in a slight descent, depending on fuel load and mission.

Air Combat Maneuvering (ACM) training for fighter aircraft is conducted in designated portions of the TFWC Range Complex and utilize a wide variety of supersonic aircraft operated at altitudes ranging from 100 ft. to 50,000 ft., as dictated by the mission and the area in which it is flown. Furthermore, fighter flying altitudes play a major role in the determination of sonic boom overpressures and boom areas. Estimates of average fighter altitudes were initially determined by an interrogation of the supersonic flight operations data in the Sonic Boom Inquiry Data Base for fighter aircraft. Based on this procedure, altitude ranges or bins of 0-5 Kft, 5-10 Kft, 10-20 Kft, 20-30 Kft and 30 Kft were selected. The next step was to define an actual average operating altitude within each altitude range. For this, Red Flag operations data on fighter altitudes during supersonic flight (taken from the Sonic Boom Inquiry Data Base input generated at Nellis Air Force Base) were averaged over the same altitude ranges. The results of this

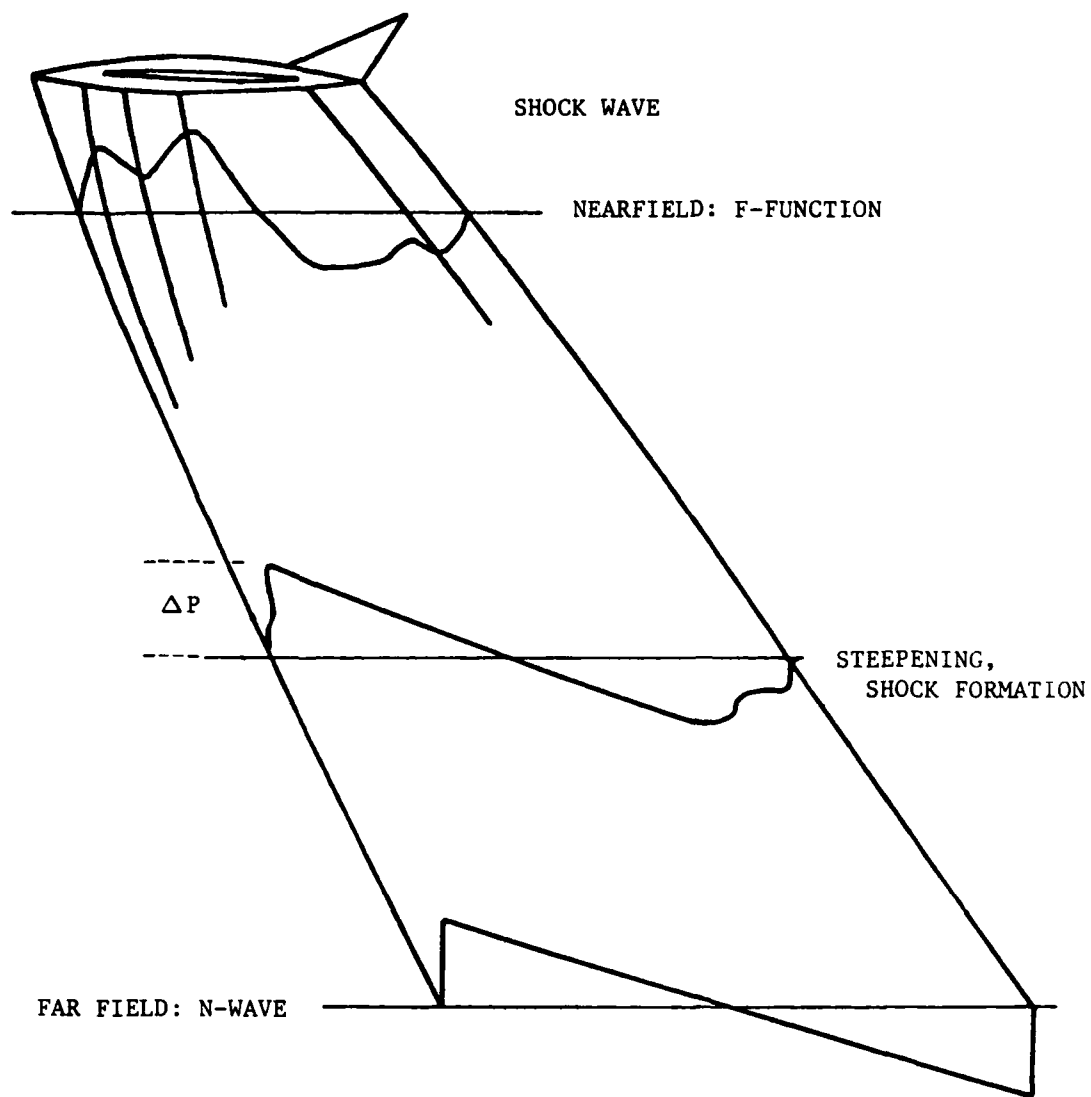


Figure 5-1. Sonic Boom Waveform Generation.

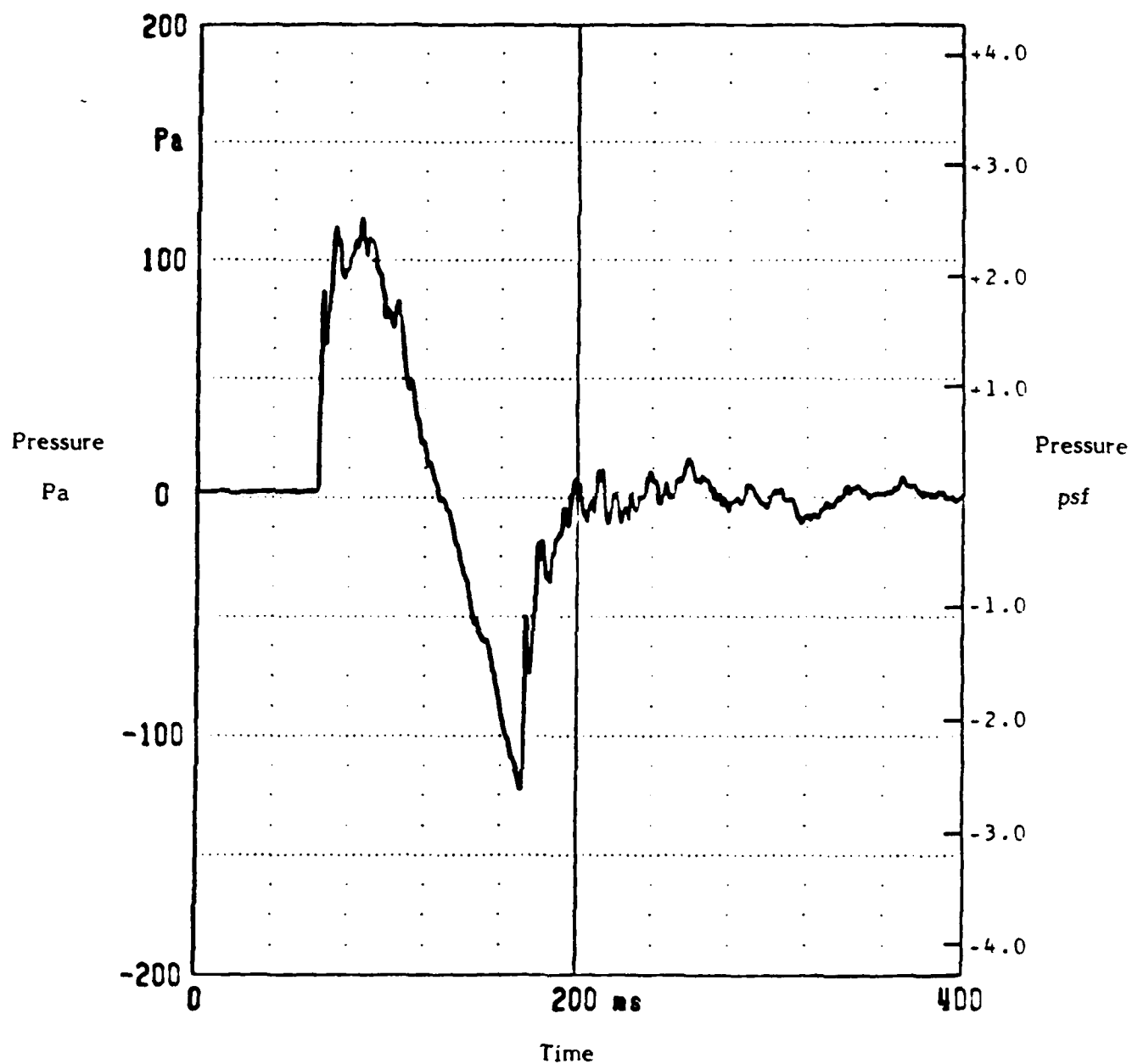


Figure 5-2. Typical Wideband Pressure Time Waveform of a Sonic Boom Due to a Maneuvering F-15 Aircraft Flying at Mach 1.1, Altitude 5 km, Minimum Slant Range to Microphone 12 km. N-wave duration about 110 ms. Positive peak flat sound pressure 118 Pa (2.5 psf); negative, 123 Pa (2.6 psf). (From Reference 22)

analysis are presented in Table 5-1. The average altitudes in Table 5-1 were then used in all final computations of fighter aircraft sonic booms for this study. The majority of supersonic flight for fighter aircraft is directly associated with ACM training. ACM is defined as the coordinated application of Basic Fighter Maneuvers (BFM) in air combat against one or more target aircraft. Depending on the tactical situations, parts of these maneuvers may be supersonic. There is, however, a general pattern. Maximum turning performance occurs at subsonic speeds, so that supersonic capability is used primarily to gain energy before or after engaging.

ACM may be analyzed in terms of two phases:

- o Straight-line full throttle acceleration to supersonic speeds.
- o Maximum-g turning motion with throttle reduced to idle power.

A supersonic aircraft in straight and level flight produces a sonic boom pattern on the ground which has been described as a moving carpet. The intensity of the sound and overpressure at ground level is largely dependent upon the aircraft's altitude and airspeed. Peak overpressures occur directly under the center line of the aircraft, diminishing at the edge of the carpet. Figure 5-3 is a depiction of a "carpet" boom.²⁴ Airspace requirements for a typical engagement of tactical aircraft can be visualized as a vertical cylinder of airspace of approximately 8-10 nautical miles in diameter (see Figure 5-4).²⁵ While in this "cylinder," the aircraft are not usually supersonic. Each engagement may last from 2 to 4 minutes. The supersonic portion of the flight, typically less than 30 seconds, occurs when aircraft engage in the type of ACM described above, i.e., acceleration to supersonic speed to gain energy, the deceleration to subsonic during the engagement. Occasionally supersonic flight will be sustained after disengagement, but this type of fuel inefficient maneuver is seldom used in training situations.

The maneuvers associated with air combat training cause boom overpressures to increase above carpet boom values, but usually by not more than 20 to 30 percent. Some acceleration and turn maneuvers do cause focal zones with overpressures two to three times carpet boom. The areas of such focal zones are, however, very small fixed areas, compared to moving carpet boom footprints. Figure 5-5 shows the relationship between the size/intensity of focus and carpet booms. For both focus and carpet booms, higher overpressures are associated with

Table 5-1

Average Altitude of Fighter Aircraft During Supersonic Air Combat Maneuvering⁽¹⁾

Altitude Range (1000 ft.)	Number of Events	Average Altitude (1000 ft.)	Standard Deviation
0 - 4.9	54	1.5	1.4
5 - 9.9	308	7.0	1.3
10 - 19.9	361	13.5	2.5
20 - 29.9	120	23.5	2.6
>30	47	33.5	4.3

(1) From Red Flag data base 1982/1983.

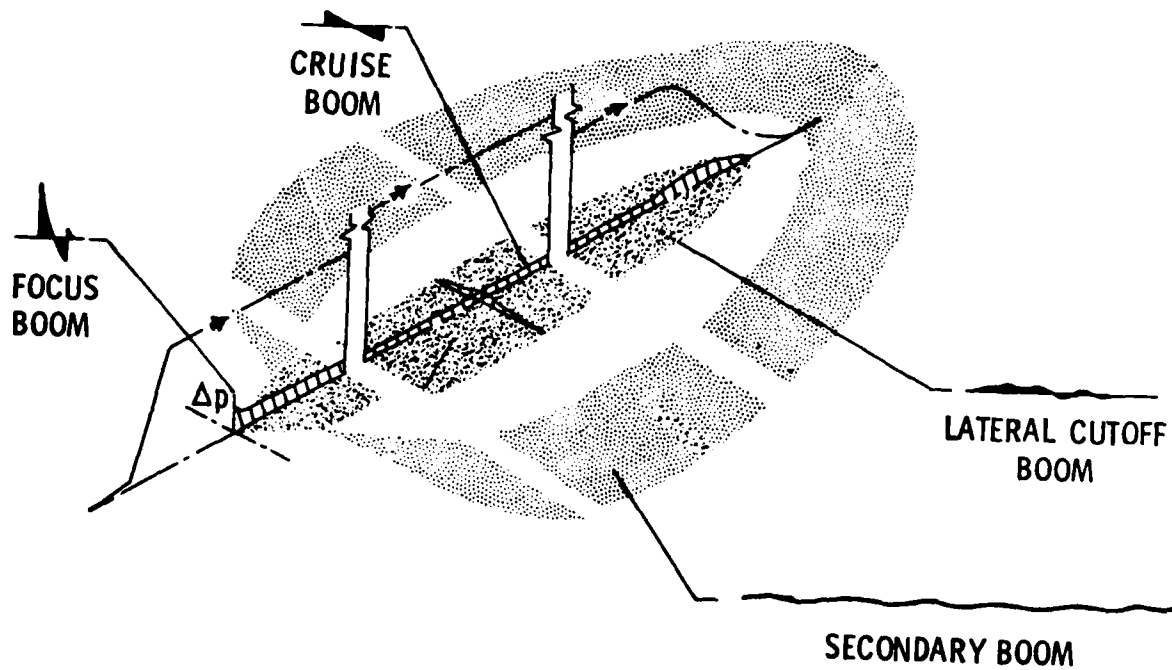


Figure 5-3. Sonic Boom Ground-Pressure Patterns - illustrating a "Carpet Boom" which is labeled a cruise boom (from Reference 24)

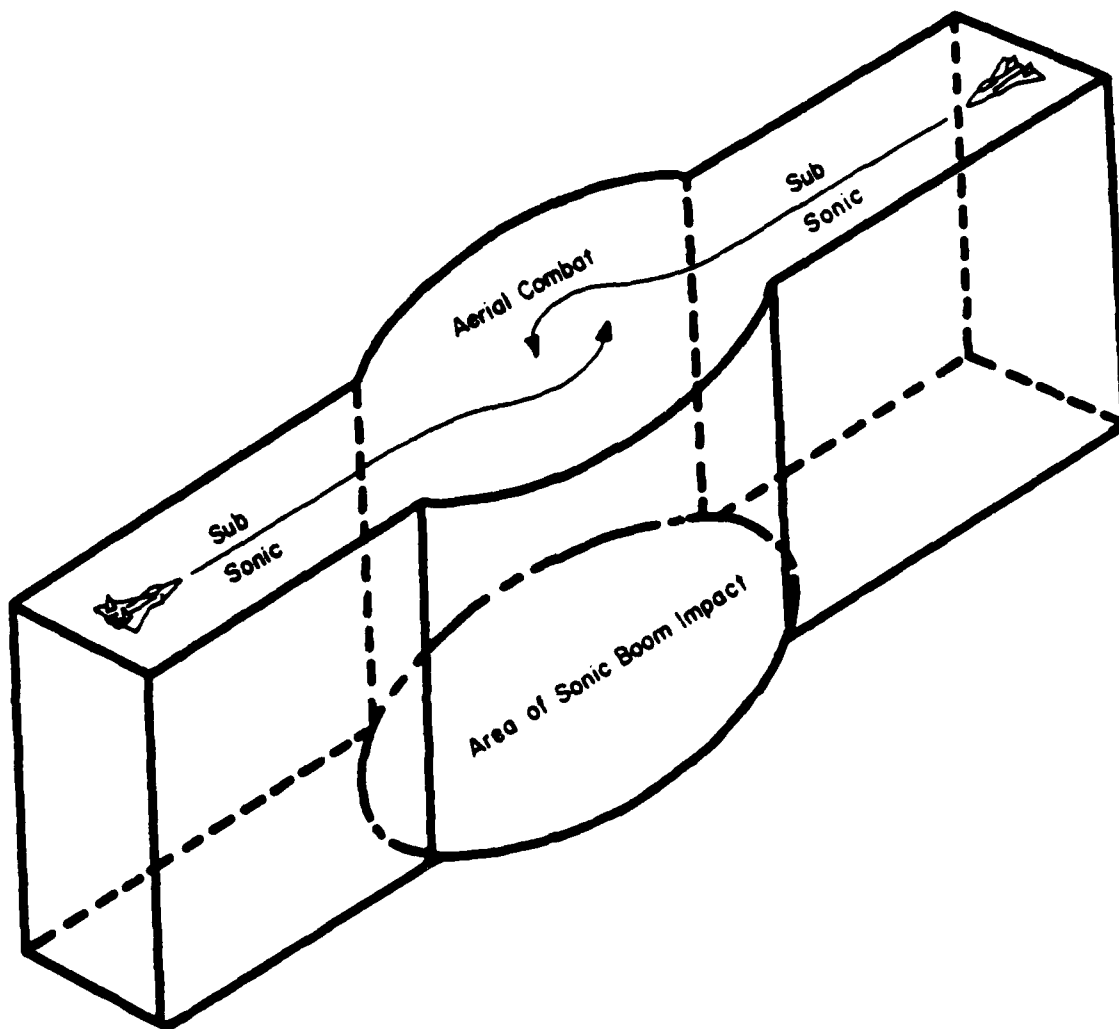


Figure 5-4. Air-to-Air Maneuvering Area Showing Sonic Boom Impact Area
(from Reference 25)

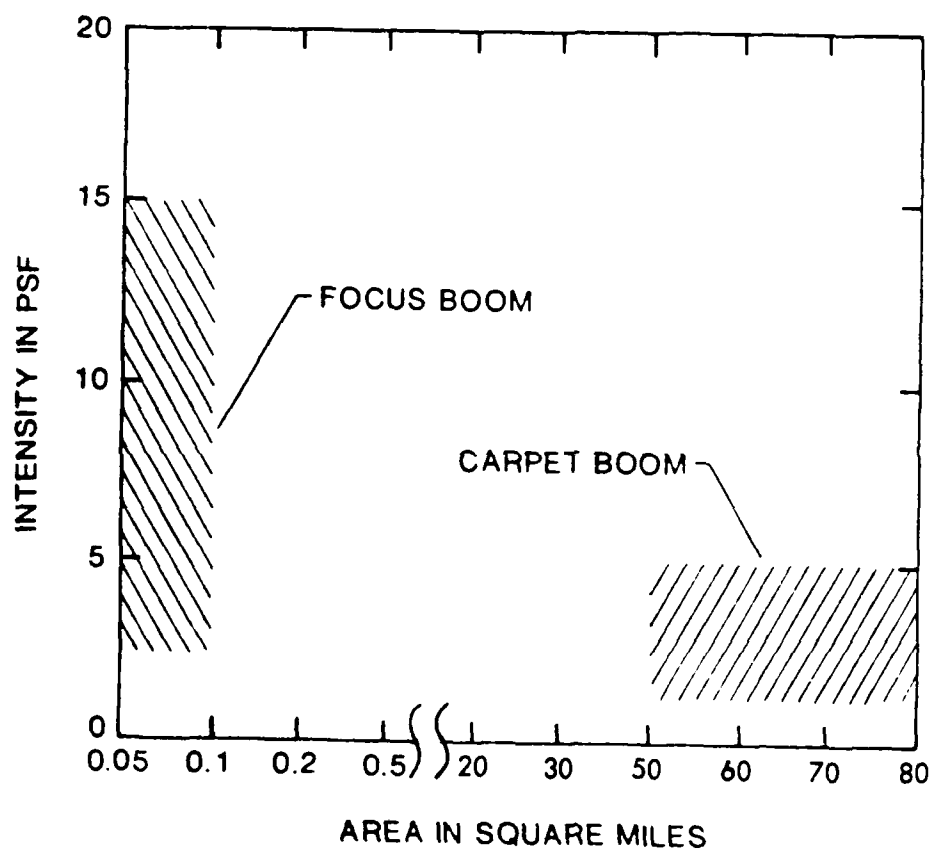


Figure 5-5. Sonic Boom Area and Intensity for Typical F-15 Air Combat Maneuvering

low flight altitudes and smaller footprint areas. The potential effect of focus booms on the estimated sonic boom environments developed in this study is discussed in Appendix B.

5.2 Simplified Sonic Boom Prediction

Several "full signature" computer programs are available which allow prediction of sonic boom in rather general conditions. However, they are somewhat cumbersome and much more complex than would be justified for this study.

A very convenient simplified model has been developed by Carlson²⁶ for calculating the sonic boom characteristics for various aircraft shapes. The sonic boom overpressure and signature duration may be predicted for the entire affected ground area for aircraft in level flight or in moderate climbing or descending flight paths. The procedure for calculation of the predicted sonic boom by the simplified method involves the following steps.

- o Determination of an aircraft shape factor
- o Evaluation of atmospheric propagation factors
- o Calculation of signature shock strength and duration

The effects of flight path curvature and aircraft acceleration are not considered in using this method. The method is further restricted to a standard atmosphere without wind. The Carlson method was shown to be within 5 percent of predictions from full-scale computer models for flight altitudes above 10,000 ft. At lower altitudes, the method diverges, overpredicting pressure and underpredicting duration. The reason for this divergence is that the simplified method is based on a far field formulation. Expressions have recently been derived for N-waves at any distance and were incorporated into Carlson's model.²⁷ The Carlson simplified boom prediction model together with the mean- and mid-field extension was applied to this study. Figure 5-6 shows a comparison between the full signature boom model, Carlson's free field model, and the current model.

Table 5-2 shows sonic boom footprint characteristics for nominal fighter and SR-71 maneuvers as determined from the current model. The following assumptions were made:

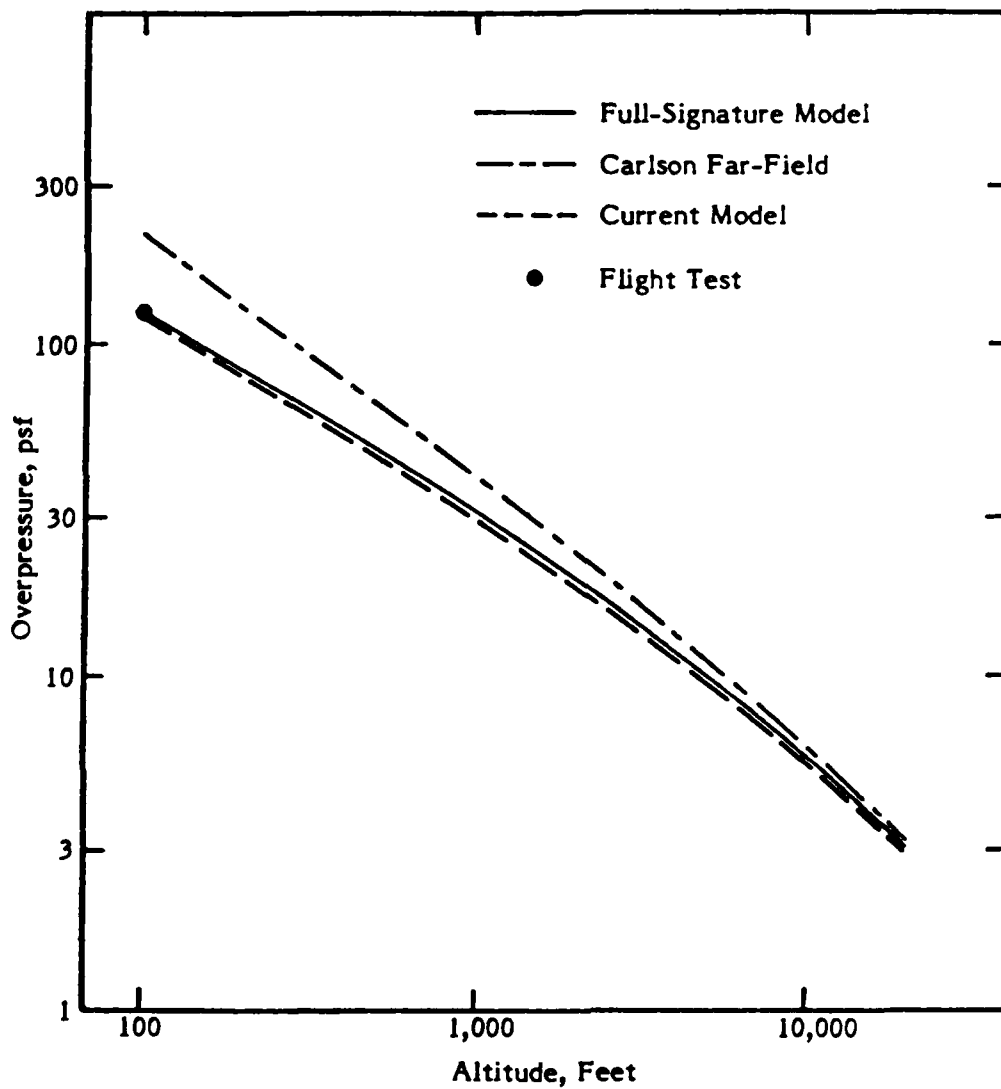


Figure 5-6. Comparison between Full-Signature Boom Model, Carlson Far-Field Model, and Current Model (from Reference 27)

Table 5-2

Nominal Sonic Boom Footprint Characteristics for Fighter and SR-71 Aircraft

A. Sonic Boom Footprints for Nominal Fighter Air Combat Maneuvers

Altitude (1000 ft.)	Mach No.	Pressure (psf)	Width (miles)	Area (sq. mi.)
1.5	1.2	13.2	6.5	26
7.0	1.2	4.9	14.0	56
13.5	1.2	3.1	19.5	78
23.5	1.2	2.1	20.0	80
33.5	1.2	1.6	18.0	72

B. Sonic Boom Footprints for Nominal SR-71 Flight Conditions

Altitude (1000 ft.)	Mach No.	Pressure (psf)	Width (miles)	Area (sq. mi.)
30	1.0	2.3	10.0	690
40	1.25	1.6	21.0	1449
60	2.0	1.1	50.0	3450
80	3.0	0.8	71.0	4899

- o The nominal fighter is assumed to be the F-15.
- o The nominal fighter Mach number = 1.2.
- o The nominal fighter footprint area is the carpet width times a track length of 4 miles, representing about 20 seconds of supersonic flight for nominal fighters.
- o Since the SR-71 operates at constant dynamic pressure, there is a one-to-one relationship between Mach number and altitude.
- o SR-71 footprint area is the carpet width times the assumed length of each segment of the supersonic flight track. For this study, the supersonic events in the State of Nevada outside the TFWC Range Complex were initially evaluated in $1^\circ \times 1^\circ$ latitude, longitude cells. Thus, for SR-71 flights, each supersonic track segment within each such $1^\circ \times 1^\circ$ cell was assumed to have a length equal to about 1° latitude or longitude, or approximately 69 miles.
- o Overpressure is assumed to be the space-averaged value across the carpet for steady level flight.
- o Maneuver effects are not accounted for.

These simplifying assumptions for estimating the sonic boom environment are considered to be reasonable based on the precision of the available operations data.

5.3 Yearly Day-Night Average C-weighted Sound Level

The metric used to describe a yearly average sonic boom exposure for the Nevada townships is $L_{C\text{dny}}$, the yearly day-night average C-weighted sound level in decibels. It is based on the combination of the number of events and the C-weighted sound exposure level, CSEL, of each event. The sonic boom model discussed earlier provides the basis for estimating the time history of the pressure signature. CSEL for such a given pressure time history $p(t)$ is defined as:

$$L_{CE} = 10 \log_{10} \left[\frac{1}{t_0} \int_0^T (P_C(t)/P_{ref})^2 dt \right] \quad (1)$$

where $P_C(t)$ is the instantaneous signal filtered by the C-weighting curve,²⁸ P_{ref} is a reference pressure of $20 \mu\text{Pa}$, T is the time span of the signal, and t_0 is a reference time of 1 second.

A methodology for calculation of CSEL for sonic boom signatures is described in Appendix C of Reference 20. The procedure, based on the equivalence of integration over time of a time varying signal and integration over frequency of the frequency spectrum of this signal, consists of the following steps:

- o Take the FFT (Fast Fourier Transform) of the pressure signature and obtain the power spectrum.
- o Multiply the power spectrum by the C-weighting frequency response as defined in Reference 28.
- o Integrate over all frequencies. The result of this frequency integration is substituted for the time integral within the brackets of Eq.(1) to define the C-weighted sound exposure level.

In reference 27, a computer program was prepared which carries out this procedure for sonic boom N-waves. Two independent parameters were considered; signature duration and shock wave rise time. Figure 5-7 shows the CSEL for 1 psf N-waves of various durations;²⁷ CSEL for other shock strengths is obtained by adding $20 \log_{10} (P_{PK}/1 \text{ psf})$ where P_{PK} is peak pressure in pounds per square foot. Note that the effects of rise time and duration on CSEL are rather small. N-wave durations for fighters range from 100 msec to about 200 msec. Shock wave rise times vary with atmospheric conditions but are typically 5-10 msec.

Based on the results in Figure 5-7, the following simplified relation between peak pressure and CSEL has been used for this study. This neglects the relatively minor effects of N-wave rise time and duration.

$$L_{CE} = 10 \log_{10} (P_{PK})^2 + 102, \text{ dB} \quad (2)$$

For a set of supersonic events over the course of a year, the yearly day-night average C-weighted sound level, CLDN, is defined as:

$$L_{Cdn} = 10 \log_{10} \left[\sum_{\text{day}} 10^{L_{CEi}/10} + 10 \sum_{\text{night}} 10^{L_{CEi}/10} \right] - 10 \log_{10} (\text{sec/year}), \text{ dB} \quad (3)$$

where L_{CEi} is the C-weighted sound exposure level for the i th aircraft.

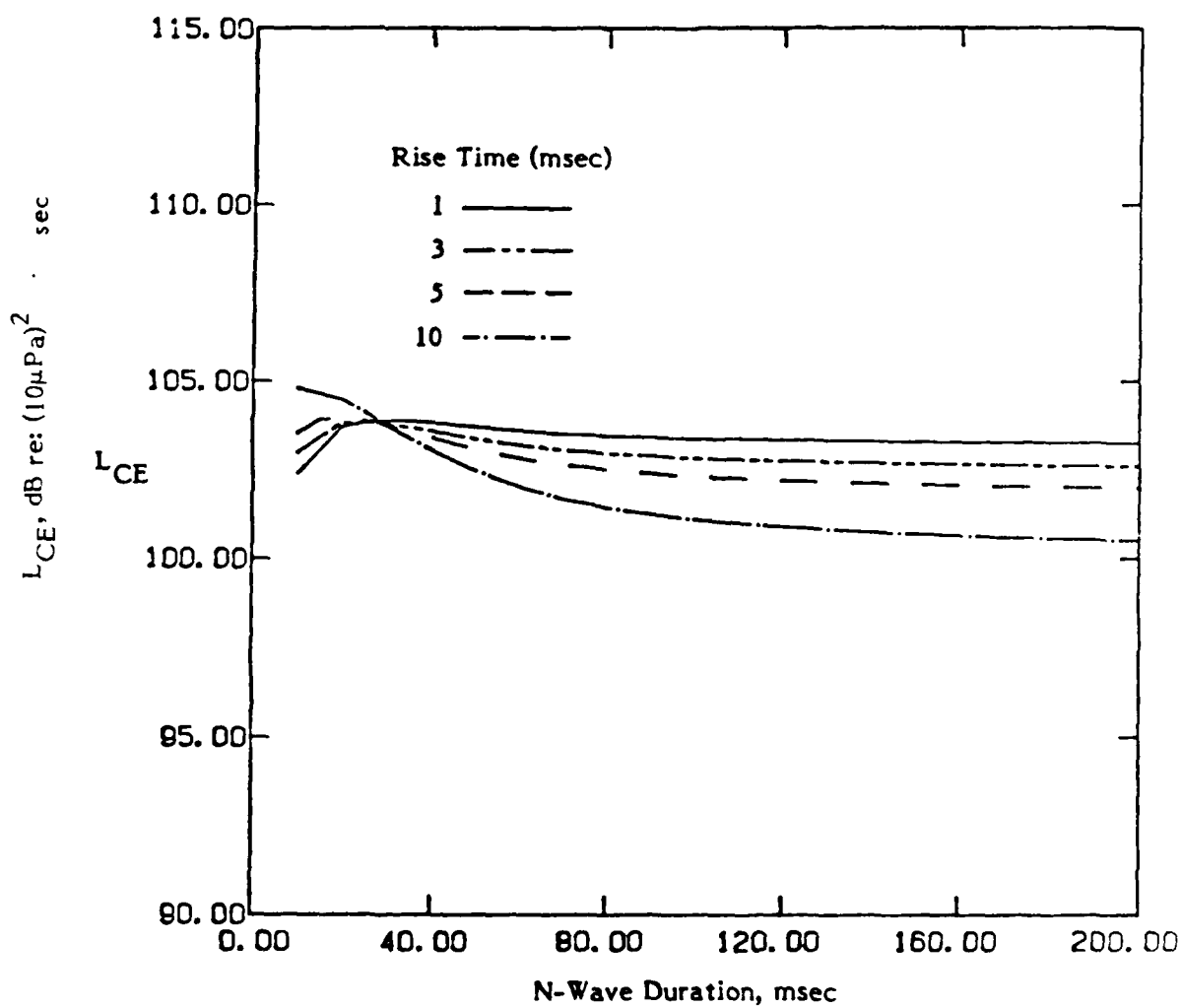


Figure 5-7. C-weighted Sound Exposure Level for Sonic Boom N-Waves with a Peak Pressure of 1 psf (from Reference 27)

However, this expression would only be valid for the space-averaged CLDN within the boundary of the sonic boom carpet width. For a given operating regime with an area greater than the area of this sonic boom carpet, assuming an equal probability of occurrence of the supersonic track within this area, an additional area weighting term must be included to define the spatial average CLDN within this larger area.

Substituting Eq.(2) into Eq.(3), dropping the term for nighttime events (supersonic flight activity apparently occurs only during the daytime) and adding the term representing spatial probability, the spatially-averaged yearly sonic boom exposure for a given area in terms of CLDN is:

$$L_{Cdn} = 10 \log_{10} \left[N \times (P_{PK})^2 \times \frac{A_C}{A_T} \right] - 27.0, \text{ dB} \quad (4)$$

where N is the number of supersonic events, A_C is the area of the carpet boom in square miles, and A_T is the total area in which supersonic activity occurs (in square miles). The value of the ratio A_C/A_T varies considerably but has been limited to a maximum value of one.

5.4 Sonic Boom Environment Definition

No one single data source investigated was able to provide a detailed space-time sonic boom environment definition. However, by utilizing applicable portions of all of them, the critically important sonic boom definition was developed.

Near the beginning of this study, it was decided that health records should be drawn from the entire State of Nevada to insure an adequate data base for evaluating what were expected to be marginal health effects (if any) due to sonic boom exposure. However, the spatial and temporal aggregation to be used in the final data analysis was not certain. Therefore, to provide a sonic boom environment data base for the final aggregation, it was decided to develop initial estimates of the sonic boom environment in Nevada as follows:

- o Temporally by year from 1969 (the second year Sonic Boom Inquiry Data were available) to 1983.
- o Spatially by 1° latitude x 1° longitude cells over the entire State and by the major divisions within the TFWC Range Complex. To provide additional clarification of the relative spatial distribution of supersonic flight within the Range Complex, the Sonic Boom Inquiry Data

Base was also interrogated by 10 minute latitude x 10 minute longitude cells over the years 1975 to 1983.

The rest of this section provides a more detailed discussion of the procedures developed to estimate the sonic boom environment. The methods used to estimate the environment within the TFWC Range Complex are defined first, followed by a description of the method used to estimate the sonic boom environment outside the TFWC Range Complex, and finally, a description of the methods used to combine these estimates into the final spatially aggregated form utilized for analysis of the health records.

Estimated Sonic Boom Environment - TFWC Range Complex

The total number of fighter aircraft sorties flown within the TFWC Range Complex were estimated from the historical records as outlined in Section 3. These estimates were summarized earlier in Table 3.1.

Estimates of supersonic events for these sorties were based on the assumption that the 57th FWW operations are split between 75 percent training air-to-air and 25 percent training combat exercises (similar to Red Flag), and that all flights of the 474th and TFW were similar to Red Flag (Large Scale Combat Exercises). The data used for supersonic events per sortie (taken from Tables 3-3 and 3-6 respectively) were applied by aircraft type for each year. Table 5-3 shows a representative sample of the resulting calculations of the number of supersonic events for the year 1978.

In summary, supersonic events of fighter aircraft within the Range Complex were estimated from:

- o Estimates of total sorties flown per year per aircraft type, reconstructed from historical records of sorties or hours flown as discussed in Section 3.
- o Estimates of supersonic events per sortie for each aircraft type and for each of two types of flight operations — air-to-air training (using Table 3-3) and combat exercises (using Table 3-6).
- o The product of these two sets of numbers for each year, aircraft type, and type of operation provided the necessary temporal distribution.

Table 5-3

Representative Calculation of Supersonic Events in the TFWC Range Complex for 1978

YEAR: 1978

Wing	Operation	Aircraft Type	Sorties Flown	Supersonic Events Per Sortie		Number of Supersonic Events
				Table	No.	
57 FWW	Training Air-to-Air	F4	3233	3-3	.23	744
		F5	9607		.38	3651
		F15	1839		.43	791
	Training Combat Exercises	F4	1077		.03	32
		F5	1974		.03	59
		F15	606		.21	127
474 TFW	Training Combat Exercises	F4	9136		.03	274
57 FWW	Red Flag Large Scale Combat Exercises	F5	1229	3-6	.03	37
		F15	7		.21	1
474 TFW		F4	1081		.03	32
Other		F4	3369		.03	101
		F5	6		.03	-
		F14	18		.35	6
		F15	2201		.21	462
		F100	605		.01 (2)	6
		F106	257		.23	59
		F111	569		.19	108
		RF4C	565		.02	11
Other (1)	Other		3738		.19 (3)	710
TOTAL:			41117		.18	7211

(1) 10% of total recorded number of sorties flown, added to account for testing and special routines

(2) Estimated for F-100 aircraft

(3) The weighted average number of supersonic events per sortie over all years and aircraft.

Appendix C contains the complete set of worksheets used to calculate the number of supersonic events per year for fighter aircraft within the TFWC Range Complex from 1969 through 1983, using this process.

Table 5-4 summarizes the final results in terms of the predicted number of supersonic events in the TFWC Range Complex for the years 1969 through 1983. The corresponding data extracted from the Sonic Boom Inquiry Data Base are also shown for comparison. As can be seen, the recorded data in the Sonic Boom Inquiry Data Base for the TFWC Range Complex are extremely low for most years. Thus, these data are considered reliable only as a measure of the relative spatial distribution of supersonic flights in TFWC Range Complex.

From discussions with Air Force personnel responsible for maintaining the Sonic Boom Inquiry Data Base, it was determined that the Sonic Boom Inquiry Data Base for 1977 probably represents the best accounting for these data within the TFWC Range Complex. As evident in Table 5-4, our prediction of the number of supersonic events for 1977 is very close to the Sonic Boom Inquiry data (within 4 percent).

It was then necessary to break down these temporal data into a spatial distribution. This was carried out in two steps. First, the entire Range Complex was divided into four parts as illustrated in Figure 5-8.

- o R4808 - a restricted area not ordinarily used by Nellis Air Force Base
- o The North Range - representing the northern part of the restricted ranges (including R4807 and R4809 for this analysis).
- o The South Range - representing the southern part of the restricted ranges (including R4806).
- o The Desert MOA - representing the remaining (eastern) section of the Range Complex where most of the day-to-day flight training occurs.

Table 5-5 shows the data from three independent methods used to estimate the spatial distribution within each of these last three areas. (Three independent estimates of operations data for R4808 were not available.)

The distribution in column 1 was calculated by interrogating the Sonic Boom Inquiry Data Base for the number of supersonic events over the years 1975 to 1979

Table 5-4

Summary of Predicted and Recorded
Supersonic Events in the TFWC Range Complex

<u>Year</u>	<u>Fighter Aircraft Sorties Flown in Nellis Range Complex</u> ⁽¹⁾	<u>Predicted Number of Supersonic Events in Nellis Range Complex</u>	<u>Average Supersonic Events per Sortie</u>	<u>Recorded Supersonic ⁽²⁾ Events in Nellis Range Complex from Sonic Boom Inquiry Report Data Base</u>
1969	30,240	5,891	.19	92
1970	16,376	3,513	.21	6
1971	25,137	4,977	.20	115
1972	20,808	4,056	.19	357
1973	20,098	4,333	.22	177
1974	21,206	4,763	.22	337
1975	20,533	4,448	.22	1,844
1976	31,540	6,602	.21	4,226
1977	40,661	8,001	.20	8,333
1978	41,117	7,211	.18	1,568
1979	42,265	7,461	.18	1,247
1980	41,065	7,484	.18	1,869
1981	46,666	7,944	.17	2,136
1982	49,801	8,133	.16	579
1983	51,028	8,573	.17	753

(1) Supersonic capable fighter aircraft sorties from historical records for 57 FWW, 474 TFW, Red Flag, and Other Sorties. The "Other Sorties" consist of sorties which were not available in historical records. These sorties were estimated as an additional 10% of the total sorties for each year.

(2) Events within 1° x 1° cells that approximate the boundary of the TFWC Range Complex excluding SR-71 aircraft.

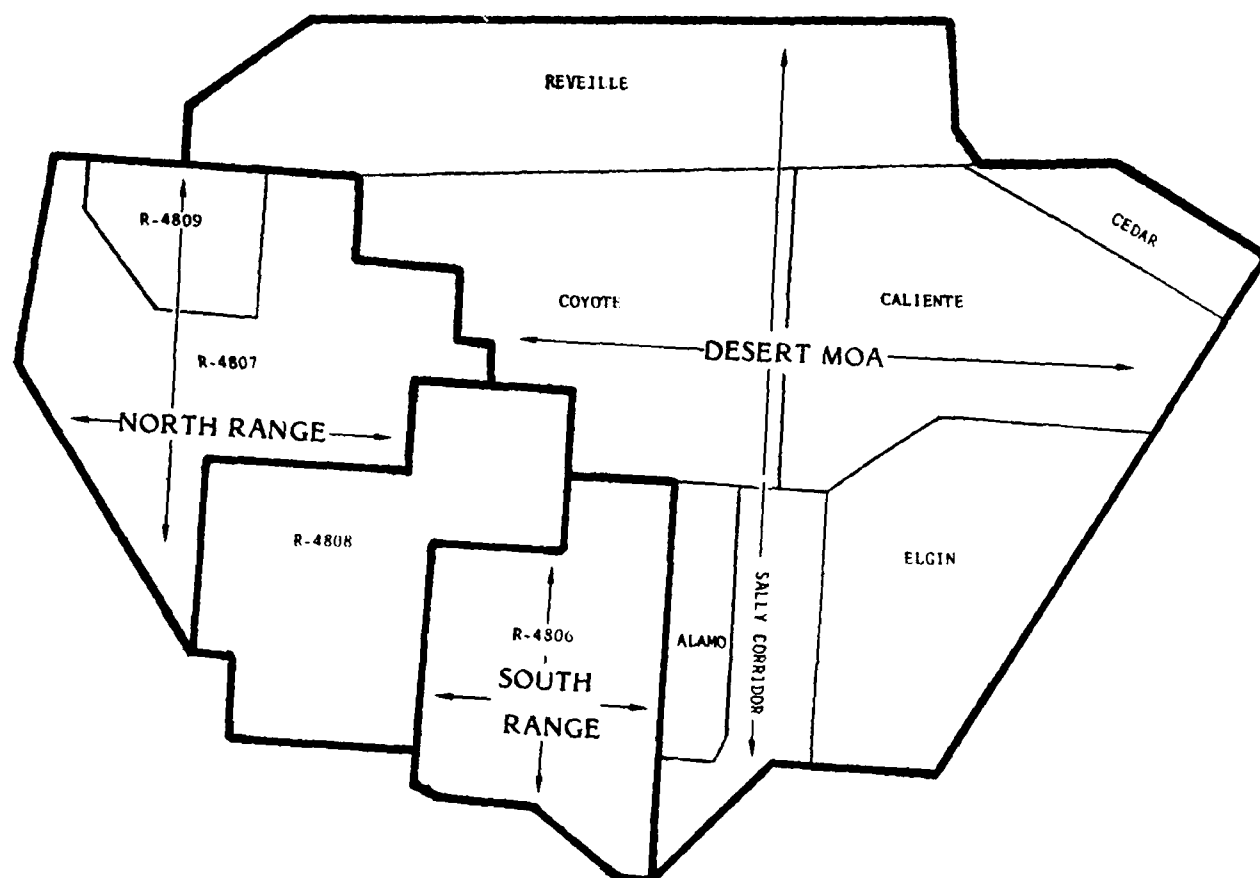


Figure 5-8. Division of TFWC Range Complex Into 4 Major Divisions (North Range, South Range, R-4809, and Desert MOA) and Their Respective Subdivisions for Which Supersonic Events are Defined.

Table 5-5
Relative Percent Distribution of Supersonic Events
in the TFWC Range Complex Excluding R4808

Area	Column 1 1975-1979 Summation of Supersonic Events in 10 Minute Cells from Sonic Boom Inquiry Report Data Base	Column 2 1983-1984 Supersonic Events by Ranges Provided Directly from Sonic Boom Inquiry Report Data Base	Column 3 Wyle Prediction Based on Supersonic Events per Sortie Applied to the Total Sortie Distribution of 25% N, 25% S, 50% Training	Column 4 ⁽¹⁾ Average of Columns 1-3
North Range	2	5	7	5
South Range	2	12	31	15
Desert MOA	<u>96</u>	<u>83</u>	<u>62</u>	<u>80</u>
TOTAL	100	100	100	100

- (1) Since the data provided are also presented by individual areas (i.e., 4806, 4807, Alamo, Elgin, etc.) and the distribution is so close to the average, the 1983/1984 data were used to establish supersonic event distribution.

in 10 minute x 10 minute latitude-longitude cells. The resulting data were then recombined into the three parts of the Range Complex by the following method. It was assumed that the number of events recorded in the data base within any 10 minute x 10 minute cell were randomly distributed over the cell, so that the total number N_i of events within say, the i th aggregated areas, were computed by a simple area-weighted summation as follows:

$$N_i = \sum_j A_{ij} \cdot N_j \quad (5)$$

where A_{ij} = the fraction of area of the i th 10 minute by 10 minute cell within the i th aggregated area (R. - North range, etc.)

N_j = the number of supersonic events within the j th cell.

The distribution in column 2 was based on a special detailed evaluation of the Sonic Boom Inquiry Data Base carried out by the Air Force for the years 1983-84 for Nellis Air Force Base.¹⁹ In this case, supersonic events that fell within each of the range complex subdivisions shown in Figure 5-8 were determined directly. The estimate of the number of events for each of the three major divisions in column 2 was determined by a simple summation of the events within the corresponding subdivision.

The distribution in column 3 predicted a flight distribution of 25 percent North Range, 25 percent South Range, and 50 percent Desert MOA, by applying the average supersonic events per sortie for these areas (.09 for the North Range where operations are primarily Red Flag type (see Table 3-6) and .35 for the South Range, and for the Desert MOA) where operations are primarily air-to-air training (see Table 3-3). The resulting values were then normalized to 100 percent.

The average distribution is shown in column 4. However, since the average distribution is so close to the 1983-1984 data, and the 1983-1984 data was also presented by individual subdivisions of the TFWC Range Complex, it was used to establish the final supersonic event distribution for fighter aircraft. Table 5-6 shows the resulting TFWC Range Complex distribution of supersonic events for fighter aircraft by subdivisions of the Ranges and Desert MOA. By combining the information contained in Tables 5-4 and 5-6, the sortie distribution for fighter

Table 5-6

TFWC Range Complex Distribution of Supersonic Events
from 1983/1984 Sonic Boom Inquiry Report Data Base

<u>Range</u>	<u>Total Supersonic Events</u>	<u>Percent Distribution</u>
R4806	417	12.0
R4807	162	4.7
R4808	40	1.1
R4809	<u>5</u>	<u>0.1</u>
Total	624	17.9
<u>Desert MOA</u>		
Alamo	376	10.8
Caliente	380	10.9
Cedar	0	0.0
Coyote	344	9.9
Elgin	1618	46.5
Reveille	104	3.0
Sally	<u>35</u>	<u>1.0</u>
Total	3,481	100.0 %

aircraft for the TFWC Range Complex was developed. This information is presented in Table 5-7 by range subdivision and year.

For SR-71 aircraft that operated over the TFWC Range Complex, the supersonic events were determined in the same manner as for SR-71 supersonic events outside the range complex, using the methods described in the next section.

Supersonic Event Distribution Outside the TFWC Range Complex

Further evaluation of the Sonic Boom Claim Inquiry Data Base was carried out for the entire State of Nevada by $1^{\circ} \times 1^{\circ}$ latitude-longitude cells to assist in establishing suitable control areas, well removed from the TFWC Range Complex, for which past sonic boom exposure has been at a minimum. Results of this analysis indicated that outside the TFWC Range Complex, total supersonic flights recorded since 1968 are dominated by SR-71 overflights by a factor of 14 to one over fighter aircraft. For illustration only, this situation is summarized in Table 5-8, based on approximating the Nevada and TFWC Range boundaries by 1° latitude or longitude increments. As indicated earlier, the reliability of the data for SR-71 flights is considered to be very high, since the data collection and report process is to a large extent automated.

While the reliability of the fighter supersonic flight data outside the TFWC Range Complex is much lower than the reliability of the SR-71 data, it was the only available source for estimating spatial distribution of supersonic events of fighter aircraft outside the TFWC Range Complex. These data show, as expected, that areas outside the Range Complex will have a relatively low exposure to sonic boom from fighter aircraft in comparison with the higher supersonic flight activity within the TFWC Range Complex.

The two main sources of data on sonic boom environment for Nevada — the Sonic Boom Inquiry Data Base and the TFWC Flight Operations data — were merged to create a single, consistent data base for estimating the sonic boom environment for each year from 1969 to 1983 for the entire State of Nevada.

Final Sonic Boom Estimates

The sonic boom environments were estimated from the supersonic events as outlined above, and on the basis of the simplified sonic boom model outlined earlier in this section. It is important to emphasize that it was assumed that every

Table 5-7

Estimated Supersonic Sortie Distribution of Fighter Aircraft
by Range/Desert MOA Subdivision for the TFWC Range Complex

Year	Range				Desert MOA							Total Sorties
	4806	4807	4808	4809	Alamo	Caliente	Cedar	Coyote	Elgin	Reveille	Sally	
1969	707	277	65	6	636	642	0	583	2739	177	59	5891
1970	422	165	39	4	379	383	0	348	1633	105	35	3513
1971	597	234	55	5	538	542	0	493	2314	149	50	4977
1972	486	191	45	4	438	442	0	402	1885	122	41	4056
1973	520	204	48	4	468	472	0	429	2015	130	43	4333
1974	572	224	52	5	514	519	0	472	2214	143	48	4763
1975	535	209	49	4	480	485	0	440	2069	133	44	4448
1976	792	310	73	7	713	720	0	654	3069	198	66	6602
1977	960	376	88	8	864	872	0	792	3721	240	80	8001
1978	865	339	79	7	779	786	0	714	3354	216	72	7211
1979	895	351	82	7	806	813	0	739	3469	224	75	7461
1980	898	352	82	7	808	816	0	741	3480	225	75	7484
1981	954	373	87	8	858	866	0	786	3695	238	79	7944
1982	977	382	89	8	878	886	0	805	3783	244	81	8133
1983	1029	403	94	9	926	934	0	849	3986	257	86	8573

Table 5-8

Supersonic Events from Sonic Boom Inquiry Data Base in State of Nevada

Year	Nevada (1)				TFWC Range Complex (2)			
	Fighters	SR-71	Total	Percent Fighters	Fighters	SR-71	Total	Percent Fighters
1969	161	336	497	32.4	92	16	108	85.2
1970	48	406	454	10.6	6	10	16	37.5
1971	206	670	876	23.5	115	11	126	91.3
1972	670	855	1525	43.9	357	25	382	93.5
1973	257	290	547	47.0	177	16	193	91.7
1974	349	593	942	37.0	337	28	365	92.3
1975	2033	721	2754	73.8	1844	50	1894	97.4
1976	4294	626	4920	87.3	4226	24	4250	99.4
1977	8374	700	9074	92.3	8333	39	8372	99.5
1978	1609	795	2404	66.9	1568	99	1667	94.1
1979	1261	733	1994	63.2	1247	66	1313	95.0
1980	1885	573	2458	76.7	1869	40	1909	97.9
1981	2227	834	3061	72.8	2136	52	2188	97.6
1982	623	991	1614	38.6	579	70	649	89.2
1983	770	780	1550	49.7	753	43	796	94.6

(1) Events within 1° x 1° cells that approximate the boundary of the State of Nevada.

(2) Events within 1° x 1° cells that approximate the boundary of the TFWC Range Complex.

supersonic event generated a sonic boom which reached the ground. In reality, for typical supersonic flight activity of fighter aircraft, it is estimated that on the average only a fraction (80 percent according to estimates by Galloway²⁰ and more like 40 percent according to the recently acquired but very limited data²¹) of supersonic events generate a boom which reaches the ground. (Atmospheric refraction of the sonic boom wave front prevents sonic booms from low Mach number flights from reaching the ground.) However, for purposes of this report, it was considered desirable to ignore this factor and assume a consistent but conservative estimate of one boom per supersonic sortie. In fact, for typical supersonic operations of SR-71 aircraft, this is a valid assumption.

The final step in the process was to change the initial spatial definition of the sonic boom environment from the breakdown by $1^{\circ} \times 1^{\circ}$ cells outside the TFWC Range Complex (and by subdivision within the Range Complex) to a single form corresponding to the one employed in the collection of the health effects data. For the latter, geopolitical subdivisions of counties called townships were employed. These townships, shown in Figure 5-9, have widely varying sizes and are not the 6 mi. x 6 mi. geographical land area divisions with the same name.

The merging of the sonic boom environment estimates into values applicable for the township divisions utilized an interpolation process similar to that outlined earlier to relate sonic boom environment estimates for $1^{\circ} \times 1^{\circ}$ cells or the TFWC Range Complex subdivisions to township areas according to the relative area overlap of each type of geographic division. Inherent in this process, based on using Eq. (5), is the same assumption employed earlier that the distribution of sonic booms throughout any one area is uniform. While the process is approximate, it is considered a reasonable method for providing sonic boom environment data in a format compatible with the massive epidemiological data base. Table 5-9 shows the present Range/Desert MOA area within the Nevada townships surrounding the TFWC Range Complex. By using the information in Tables 5-7 and 5-9, the supersonic sortie and corresponding sonic boom distribution by Nevada township was determined. This information is presented in Table 5-10.

Based on the methods described in the preceding text, the sonic boom environment for the entire State of Nevada by township for the years 1969 to 1983, for tactical aircraft only, SR-71 aircraft only, and for all supersonic aircraft, were

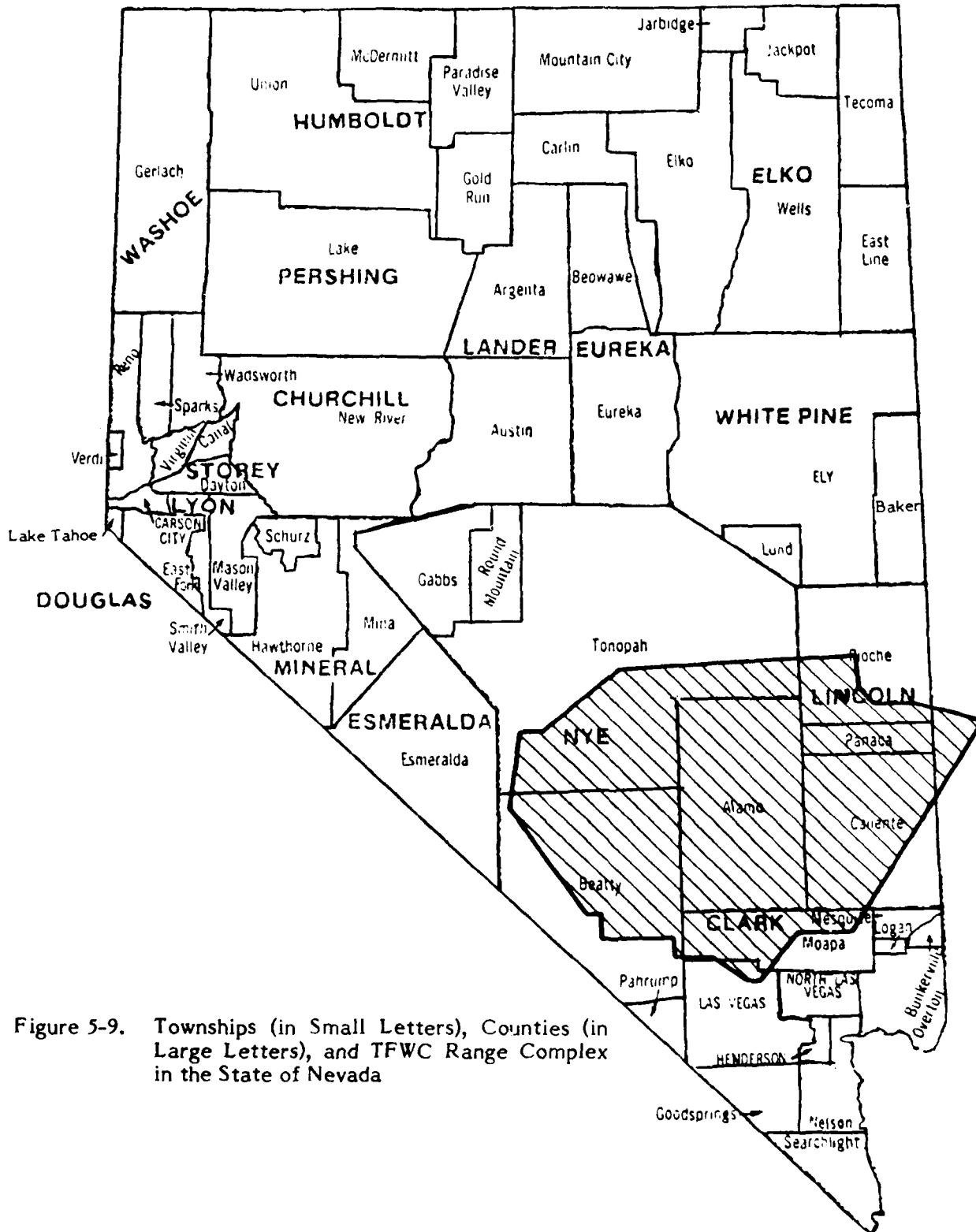


Figure 5-9. Townships (in Small Letters), Counties (in Large Letters), and TFWC Range Complex in the State of Nevada

Table 5-9
Percent Range/Desert MOA Area Subdivisions
Within Townships Surrounding TFWC Range Complex

	Townships							
<u>Range</u>	<u>Alamo</u>	<u>Beatty</u>	<u>Caliente</u>	<u>Moapa</u>	<u>North Las Vegas</u>	<u>Panaca</u>	<u>Pioche</u>	<u>Tonopah</u>
4806	50			36	14			
4807		63						37
4808	20	80						
4809								100
<u>Desert MOA</u>								
Alamo	80			20				
Caliente			66			25	9	
Cedar						40	60	
Coyote	88							12
Elgin			90	10				
Reveille	12						27	61
Sally	42		24	34				

Table 5-10

Supersonic Sortie Distribution for the Years 1969 to 1983
for all Nevada Townships that Fall Partly Within the TFWC Range Complex

<u>Year</u>	<u>Township</u>							<u>Total Sorties</u>
	<u>Alamo</u>	<u>Beatty</u>	<u>Caliente</u>	<u>Moapa</u>	<u>North Las Vegas</u>	<u>Panaca</u>	<u>Pioche</u>	<u>Tonopah</u>
1969	1434	227	2902	676	99	161	106	286
1970	856	135	1730	403	59	96	63	171
1971	1213	191	2451	571	84	136	89	242
1972	988	156	1998	465	68	111	73	197
1973	1055	167	2135	497	73	118	78	210
1974	1160	183	2347	546	80	130	85	232
1975	1083	171	2193	510	75	121	80	215
1976	1608	254	3253	757	111	180	118	321
1977	1948	307	3944	918	134	218	143	389
1978	1756	277	3554	827	121	197	129	350
1979	1817	287	3677	856	125	203	134	362
1980	1822	287	3690	858	126	204	134	363
1981	1934	305	3915	911	134	217	142	386
1982	1980	312	4008	933	137	222	146	395
1983	2088	329	4225	983	144	234	153	417

estimated. The results are presented in Appendix D. Table 5-11 presents a sample of the final computer output of the supersonic exposure for Nevada for the year 1978 for tactical aircraft only. Note that the column identified as CLDN is actually the yearly CLDN.

Table 5-11

**Sample Computer Output of Sonic Boom Exposure in the State of Nevada
for Tactical Aircraft for 1978**

1978 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.00	0.00	0.0		0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0		0.0	0.000
03	BUNKERVILLE	109	0.42	2.31	75.7		28.9	0.006
04	GOODSPRINGS	1095	1.80	1.60	72.0		21.8	0.005
05	HENDERSON	219	1.76	3.14	74.8		34.7	0.024
06	LAS VEGAS	1642	121.00	3.58	74.8		45.5	1.670
07	LOGAN	73	0.28	2.31	75.7		28.8	0.004
08	MESQUITE	219	0.84	2.31	75.7		28.9	0.012
09	MOAPA	1533	827.00	3.50	74.8		53.9	11.417
10	NELSON	730	1.60	1.91	73.6		24.7	0.022
11	N LAS VEGAS	511	8.44	3.41	74.9		38.6	0.116
12	OVERTON	1131	4.34	2.31	75.7		28.9	0.060
13	SEARCHLIGHT	803	1.32	1.60	72.0		21.8	0.018
15	EAST FORK	730	0.00	0.00	0.0		0.0	0.000
16	TAHDE	36	0.00	0.00	0.0		0.0	0.000
18	CARLIN	1606	0.00	0.00	0.0		0.0	0.000
19	EAST LINE	1533	2.10	2.90	78.4		26.6	0.025
20	ELKO	3467	0.00	0.00	0.0		0.0	0.000
21	JACKFOT	1168	0.00	0.00	0.0		0.0	0.000
22	JARRIDGE	365	0.00	0.00	0.0		0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0		0.0	0.000
24	TECOMA	2043	0.15	2.90	78.4		13.8	0.002
25	WELLS	4161	1.90	2.90	78.4		21.8	0.006
27	ESMERALDA	3503	0.22	4.90	56.0		16.3	0.003
28	BEOWAWE	1387	0.00	0.00	0.0		0.0	0.000
29	EUREKA	2773	1.56	1.60	72.0		17.2	0.022
31	GOLD RUN	1424	0.00	0.00	0.0		0.0	0.000
32	MCDERMITT	1533	0.16	1.60	72.0		9.8	0.002
33	PARADISE VALY	1387	0.00	0.00	0.0		0.0	0.000
34	UNION	5621	1.16	1.60	72.0		12.8	0.006
36	ARGENTA	2519	0.00	0.00	0.0		0.0	0.000
37	AUSTIN	3138	0.99	1.60	72.0		14.6	0.014
39	ALAMO	3941	1756.00	2.32	79.5		49.8	24.141
40	CALIENTE	3066	3554.00	2.33	79.0		54.0	49.141
41	PANACA	621	197.00	2.33	79.0		48.3	2.718
42	FLOCHE	2737	129.00	2.33	79.0		40.1	1.780
44	CANAL	182	0.00	0.00	0.0		0.0	0.000
45	DAYTON	438	0.00	0.00	0.0		0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0		0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0		0.0	0.000
49	HATHORNE	1971	0.00	0.00	0.0		0.0	0.000
50	MINA	1387	0.08	4.90	56.0		15.9	0.001
51	SCHUKZ	401	0.00	0.00	0.0		0.0	0.000
53	BEATTY	4526	277.00	2.45	78.9		41.6	3.812
54	GABBS	1569	0.32	4.90	56.0		21.4	0.004
55	PAHRUMP	292	5.04	3.53	74.8		39.1	0.070
56	ROUND MNTAIN	730	0.16	4.90	56.0		21.7	0.002
57	TONOPAH	10183	350.00	2.31	79.4		38.6	4.830
59	LAKE	5984	0.00	0.00	0.0		0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0		0.0	0.000
61	GERLACH	4343	0.68	1.44	64.6		10.2	0.007
62	RENO	766	0.00	0.00	0.0		0.0	0.000
63	SPARKS	621	0.00	0.00	0.0		0.0	0.000
64	VERDI	73	0.00	0.00	0.0		0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0		0.0	0.000
67	BAKER	1168	0.00	0.00	0.0		0.0	0.000
68	ELY	7190	0.60	2.90	78.4		14.4	0.008
69	LUND	694	0.00	0.00	0.0		0.0	0.000
TOTAL		109889	7246.92					100.000

6.0 CONCLUSIONS

A study has been carried out to investigate possible human health effects caused by exposure of people to sonic boom. The subjects of the study were the residents of the State of Nevada. This state was selected for the study because supersonic military flight operations have been carried out in Nevada, primarily within the boundaries of the Tactical Fighter Weapons Center (TFWC) Range Complex near Las Vegas, longer than in any other area within the United States. This volume presents estimates of sonic boom environments in the State of Nevada during the period from 1969 to 1983. The estimates are based on an extensive analysis of historical records (from Nellis Air Force Base) of supersonic fighter aircraft operations within the TFWC Range Complex, and on available computerized records of supersonic operations of both fighter and SR-71 aircraft within all areas inside the State of Nevada. These latter computerized records are maintained in a Sonic Boom Inquiry Data Base by the Department of Defense, and are intended to include records of all military or DOD-contractor supersonic flight operations throughout the United States. Through analysis of these historical data it was possible to reconstruct a reasonable definition of supersonic capable aircraft operations.

The extensive operations data from Nellis Air Force Base concerning the number of sorties and hours flown within the TFWC Range Complex were considered to be quite reliable. Since very limited data were available in the Nellis historical records for relating the type of operations and their spatial distribution within the range, estimates of spatial distribution within the range have been based on fairly complete data for recent years and have been extrapolated back in time. These independent estimates of spatial distribution of supersonic operations within the TFWC Range Complex were also found to be reasonably consistent with data in the Sonic Boom Inquiry Data Base. Outside the range complex, the validity of the supersonic fighter operations obtained from the Sonic Boom Inquiry Data Base was considered less reliable but was utilized as the only available historical data for supersonic fighter operations outside the Range Complex. For example, this computer data base may not include data on some infrequent and unintentional supersonic flights which occurred prior to 1985 in Military Operating Areas near the Fallon Naval Air Station. However, the SR-71 operations derived from this data base were considered to be reliable because of the semi-automated data entry

procedure on SR-71 supersonic operations. Thus, the estimates of sonic boom environments throughout all populated areas within the State of Nevada are considered sufficiently reliable for purposes of this study.

The yearly day-night average C-weighted sound level due only to sonic booms, space-averaged over each township in the State of Nevada, ranged from 0 in a few townships (indicating no evidence of any sonic booms during a particular year) to a maximum of 56 dB in one year in Caliente Township. The latter lies within that portion of the TFWC Range Complex which is most heavily utilized for supersonic flight activity by Nellis Air Force Base. Figures 6-1 to 6-4 illustrate the overall temporal and spatial pattern of the yearly CLDN for all aircraft for the years 1970, 1975, 1980 and 1983.

Other measures of sonic boom environment included in this report are number of supersonic events, average sonic boom overpressure, and sonic boom carpet area (for SR-71 or fighter aircraft separately) within a given township.

The space-averaged CLDN values may not be comparable to values for which adverse community response to impulsive noise is anticipated, but must be considered only as quantitative measures of the relative sonic boom exposure in each township area within the State of Nevada. However, these CLDN values provide a suitable measure of cumulative exposure to sonic boom environments, which can be effectively employed in searching for a possible correlation with health effects.

Volume II, prepared by the Department of Community and Environmental Medicine of the University of California, Irvine, reports the results of this search in an extensive statistical analysis probing for any possible correlation between the sonic boom exposure estimates reported herein and all available health data (mortality and morbidity) for Nevada residents for the same geographic areas and time periods. From the data collected in this study and presented in these two volumes, no convincing evidence was found to prove or disprove the existence of adverse health effects due to exposure to sonic boom.

In summary, this study has clearly demonstrated the viability of acquiring and analyzing the type of global measures of sonic boom environment and health effects employed in this retrospective study. However, it has also demonstrated that the global measures employed in this study do not show any evidence for the

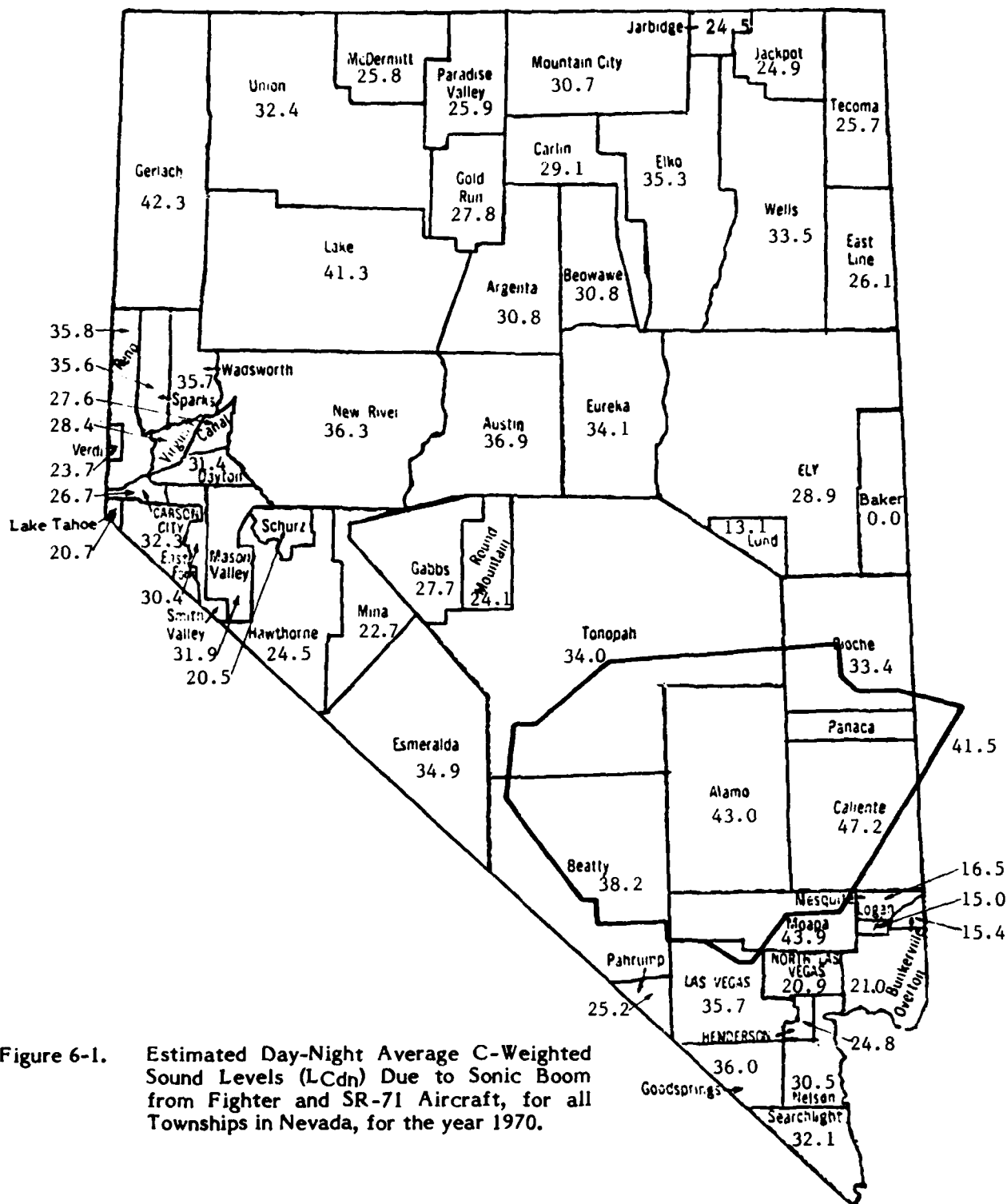


Figure 6-1. Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft, for all Townships in Nevada, for the year 1970.

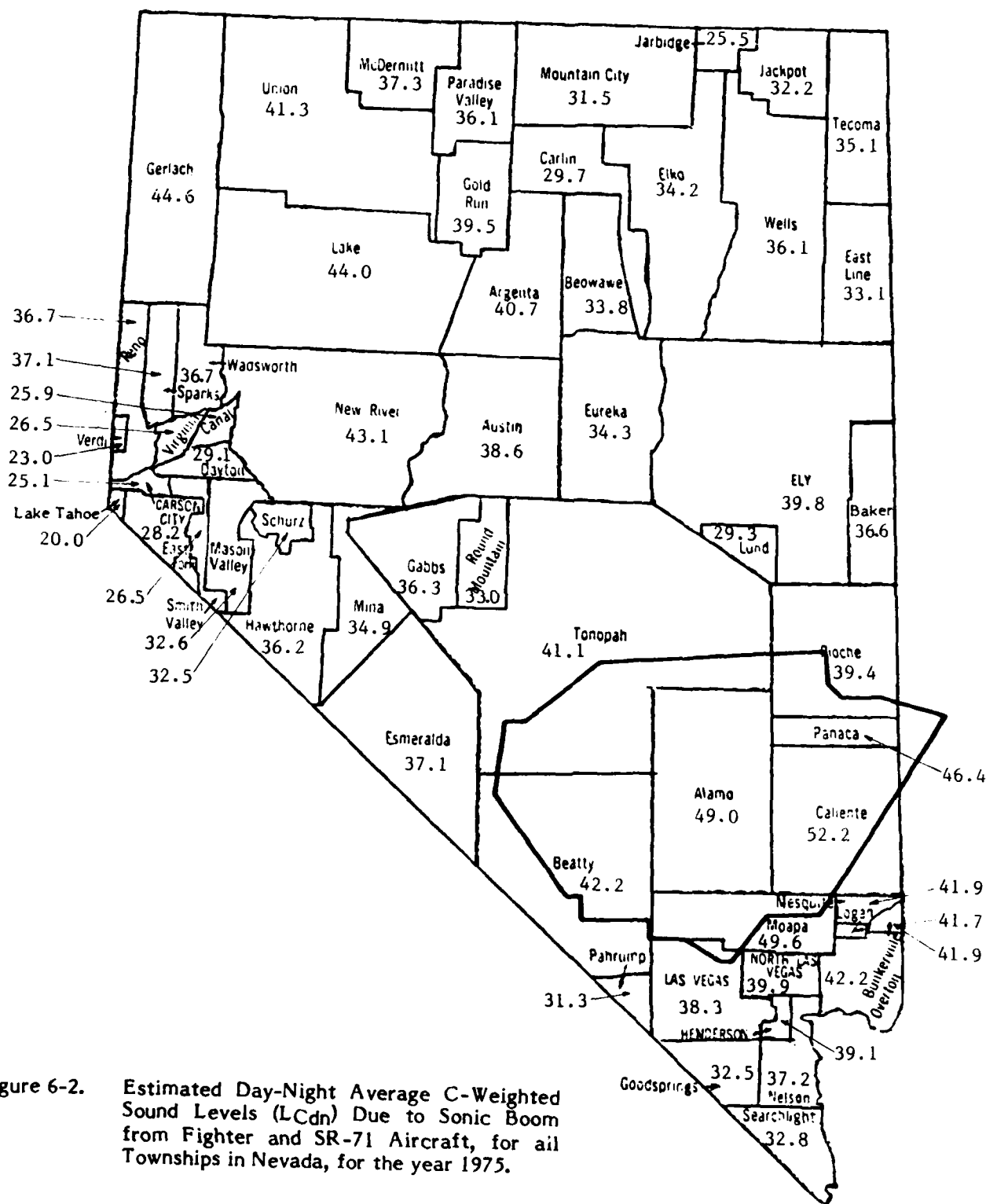


Figure 6-2. Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft, for all Townships in Nevada, for the year 1975.

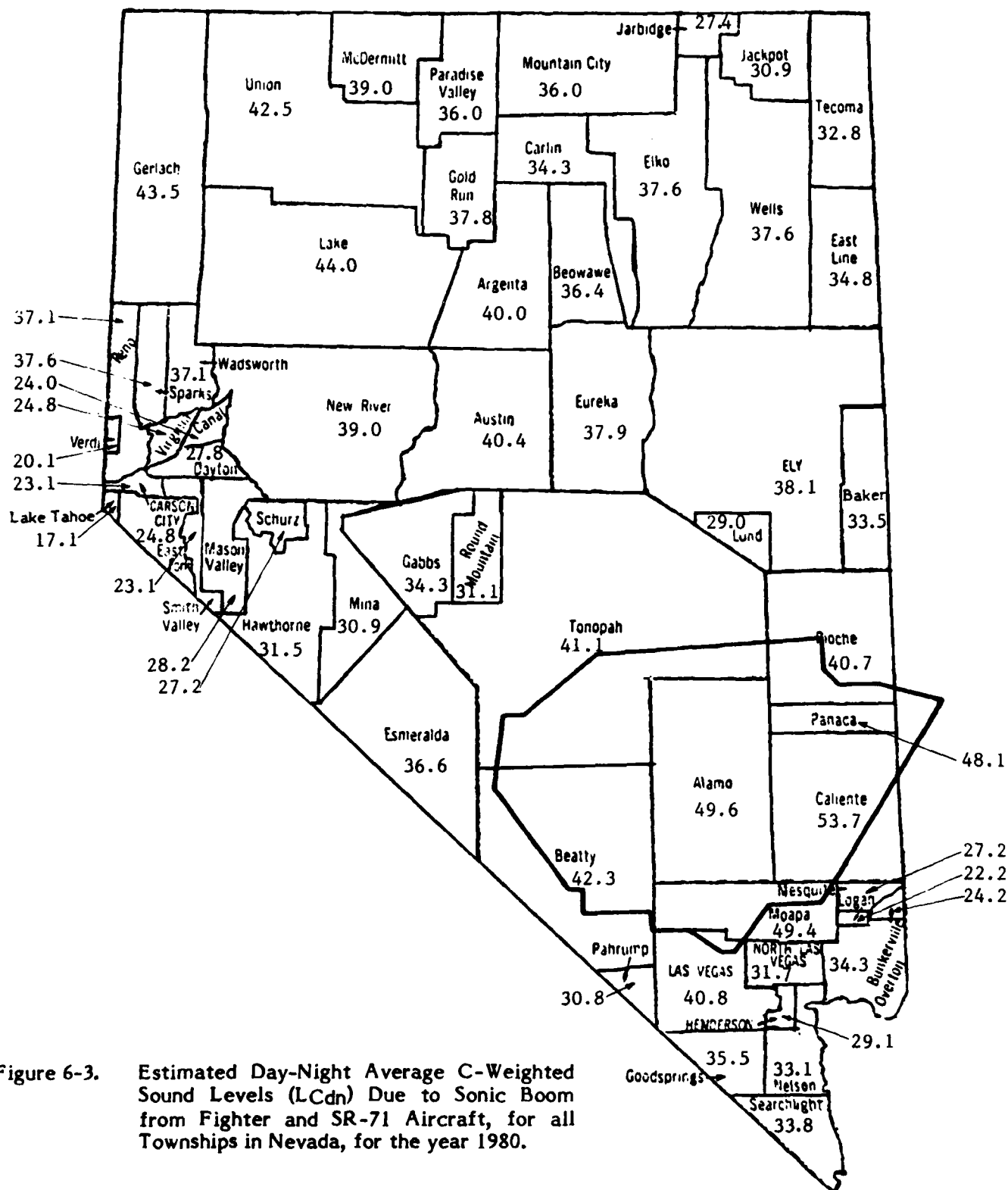


Figure 6-3. Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft, for all Townships in Nevada, for the year 1980.

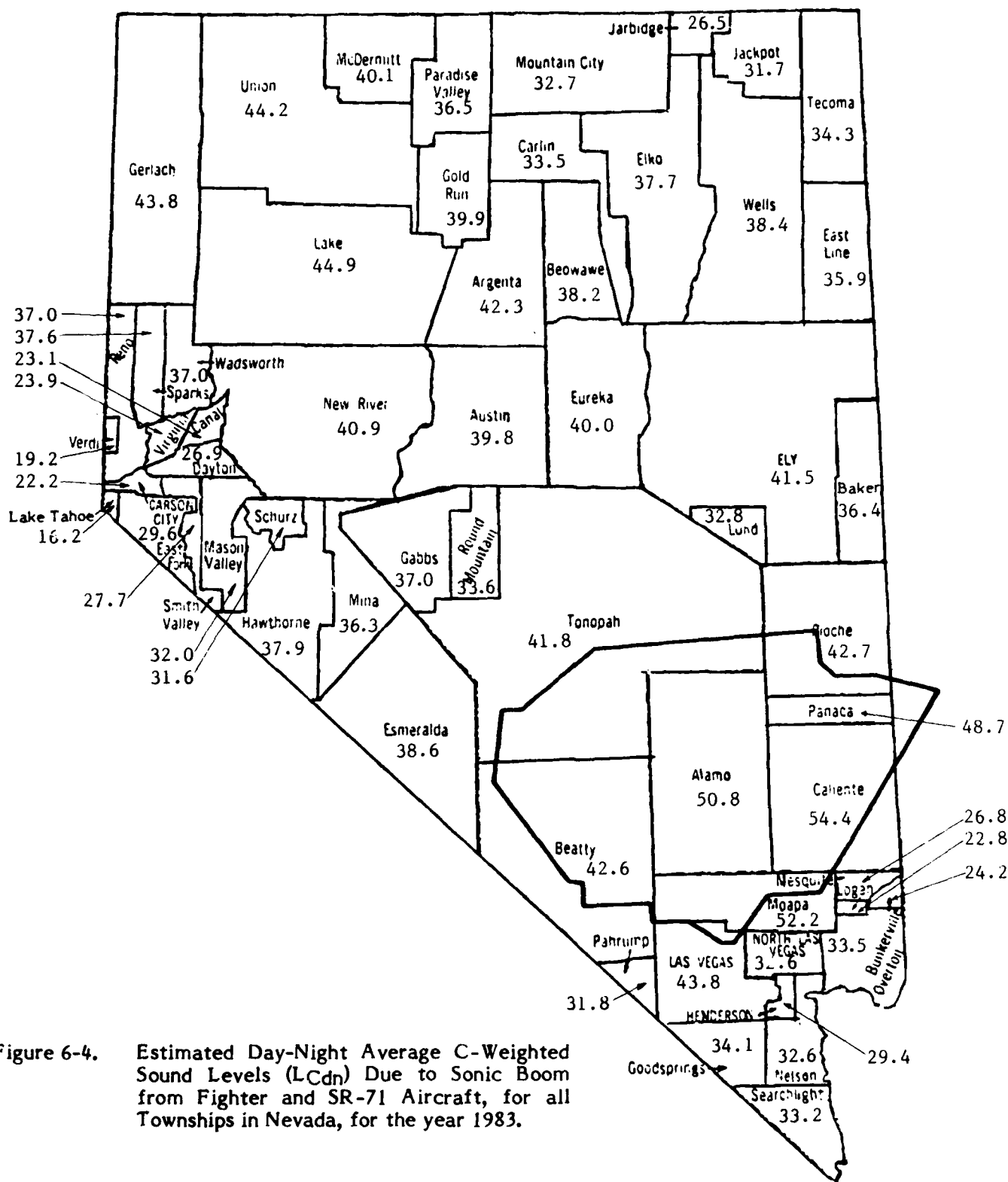


Figure 6-4. Estimated Day-Night Average C-Weighted Sound Levels (LCdn) Due to Sonic Boom from Fighter and SR-71 Aircraft, for all Townships in Nevada, for the year 1983.

existence of possible health effects due to sonic boom exposure. Any such evidence, if it exists, is most likely to be found only in a prospective study monitoring a substantial sample of individuals over a prolonged time period.

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APPENDIX A

This appendix contains several maps of the TFWC Range Complex, illustrating how it has changed in minor details over the years 1968 to 1983.

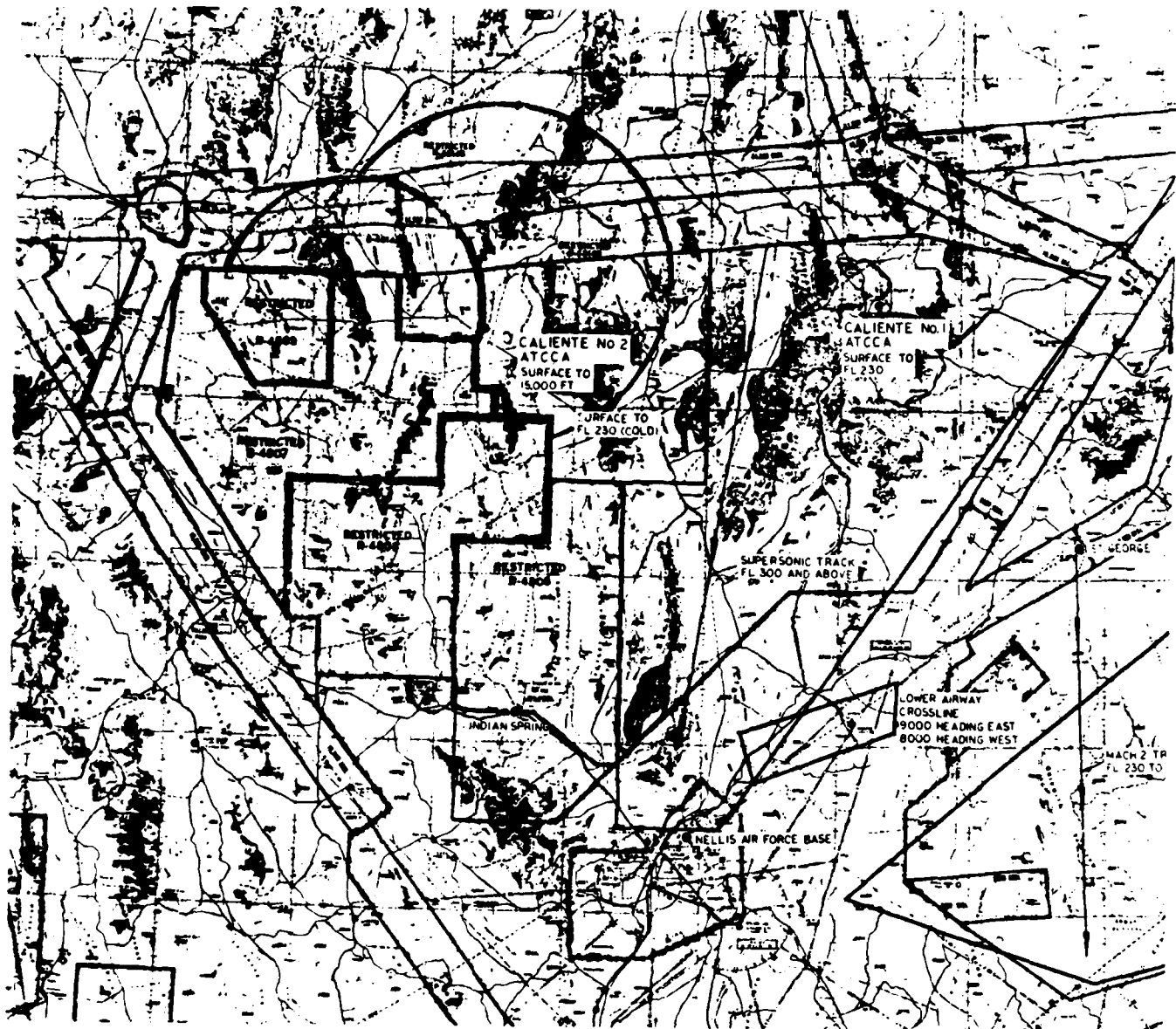


Figure A-1. TFWC Range Complex as of 1968 (from Reference 2)

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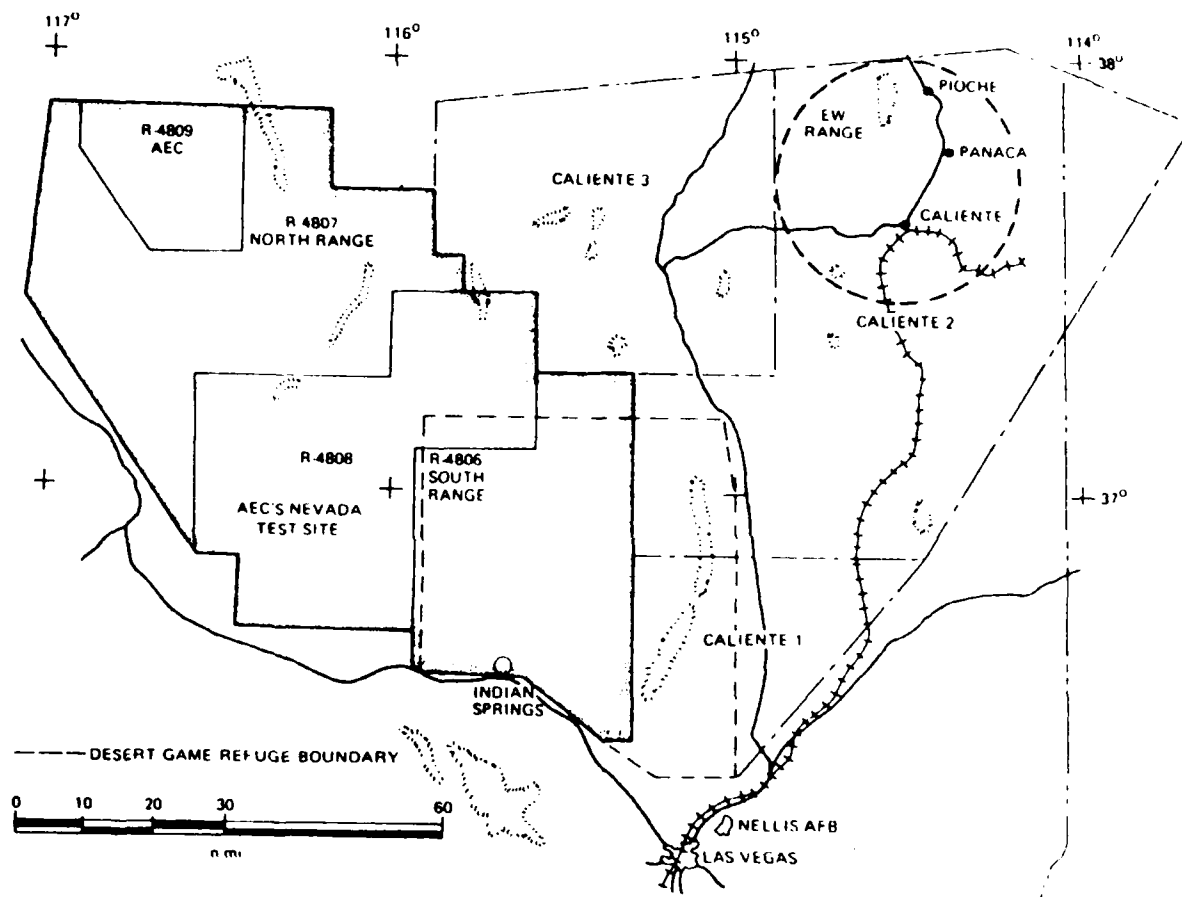


Figure A-2. TFWC Range Complex as of 1974 (from Reference 14)

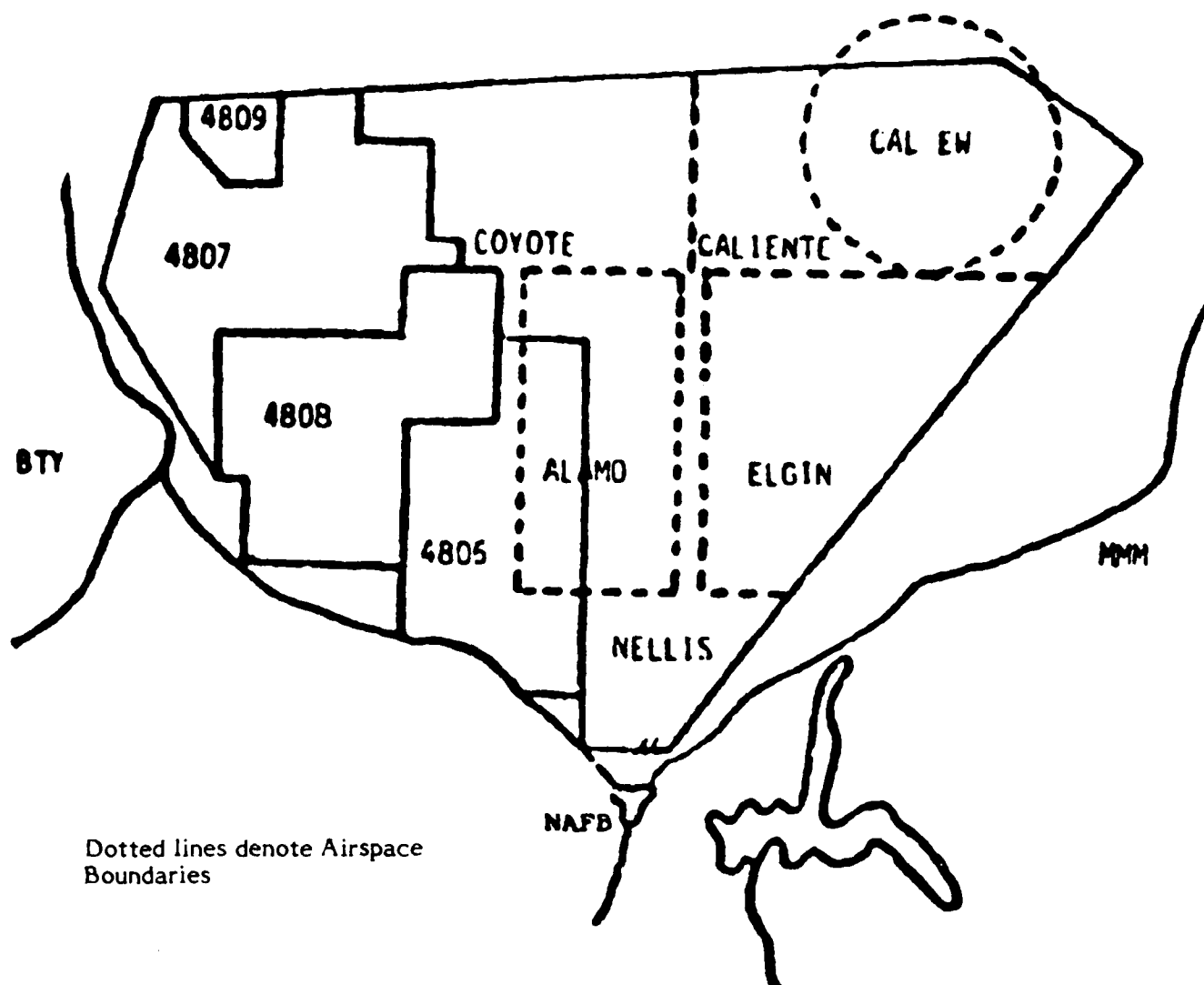


Figure A-3. TFWC Range Complex as of 1975 (from Reference 18)

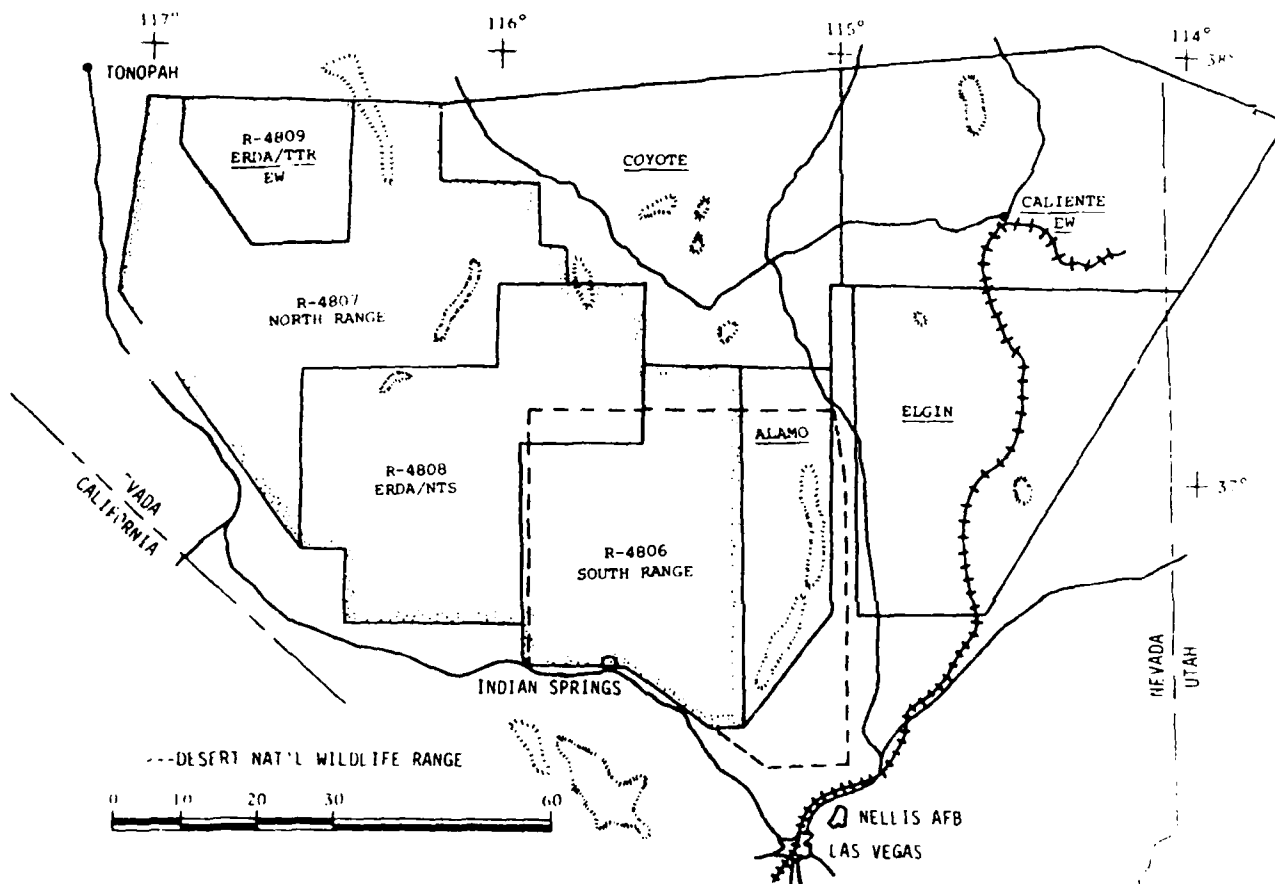


Figure A-4. TFWC Range Complex as of 1976 (from Reference 13)

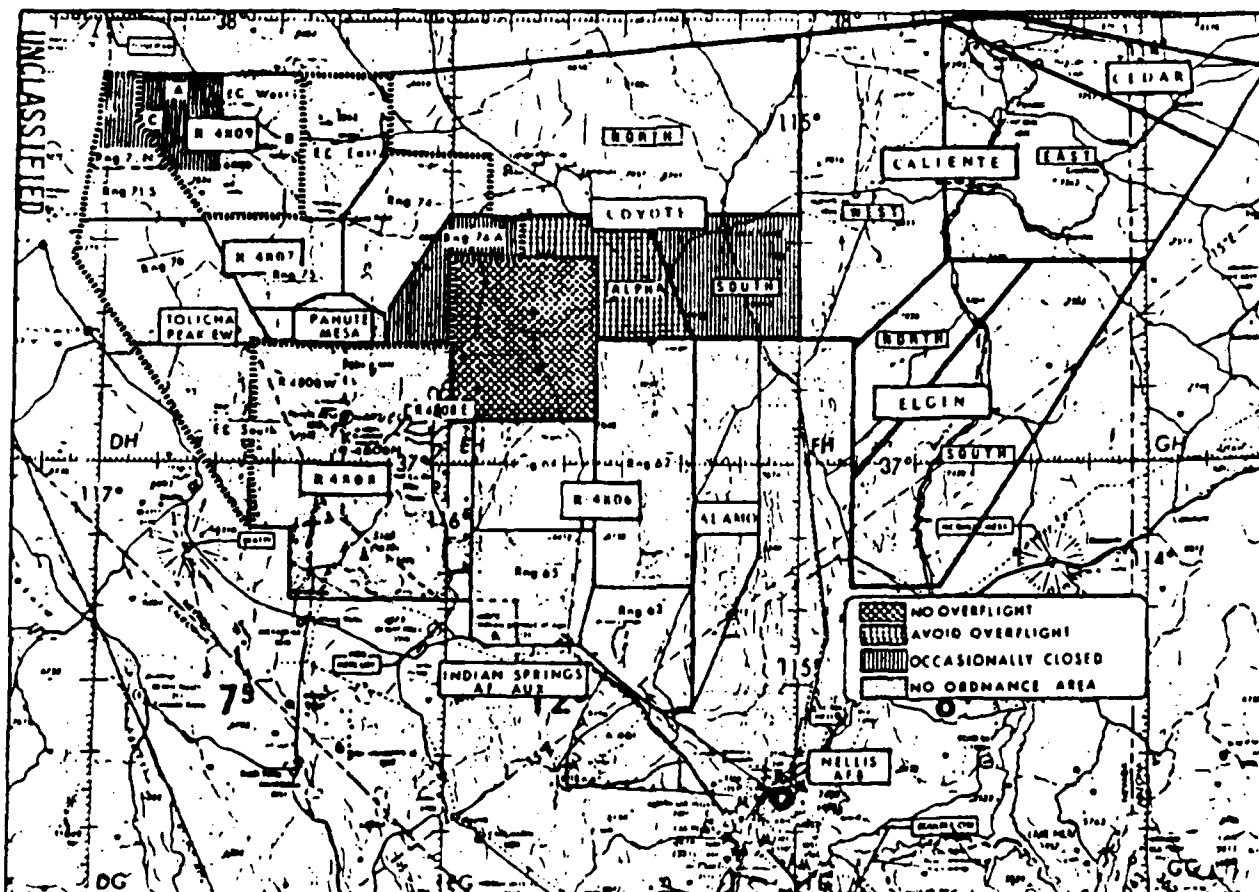


Figure A-5. TFWC Range Complex as of 1982 (from Reference 29)

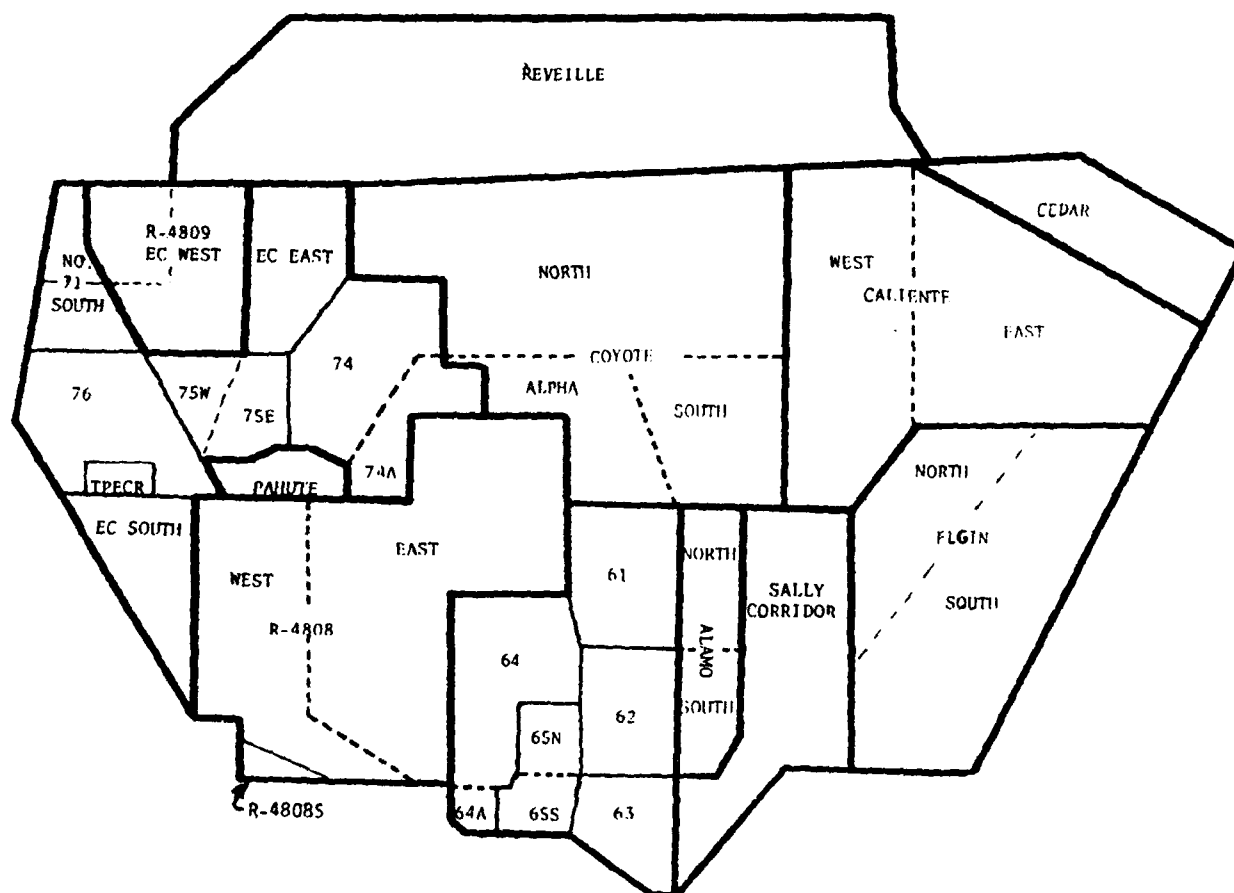


Figure A-6. TFWC Range Complex as of 1983 (from Reference 4)

APPENDIX B

Characteristics of Focus Booms

Intensified booms resulting from various fighter maneuvers cause ground level overpressures two to three times higher than carpet boom overpressures. Although the focus boom overpressures are higher, the focal zone areas are considerably smaller when compared to carpet boom footprints. Figure B-1 shows the relationship between the size/intensity of focus and carpet booms.

Table B-1 shows that the occurrence of these focus booms will not affect the yearly CLDN. These examples use Eq.(4) of Section 5.3 and the 1978 Tactical Aircraft data in Appendix D. The following conservative assumptions have been made.

- o That the focus boom overpressure is three times that of carpet boom overpressure.
- o That the average focus boom area is 0.1 sq. mi.²³
- o That all focus booms reach the ground and that there is a focus boom for every carpet boom.

As shown in Table B-1, the effect of focus boom on the yearly CLDN caused by carpet booms can be considered negligible and therefore has been omitted from further consideration in this study.

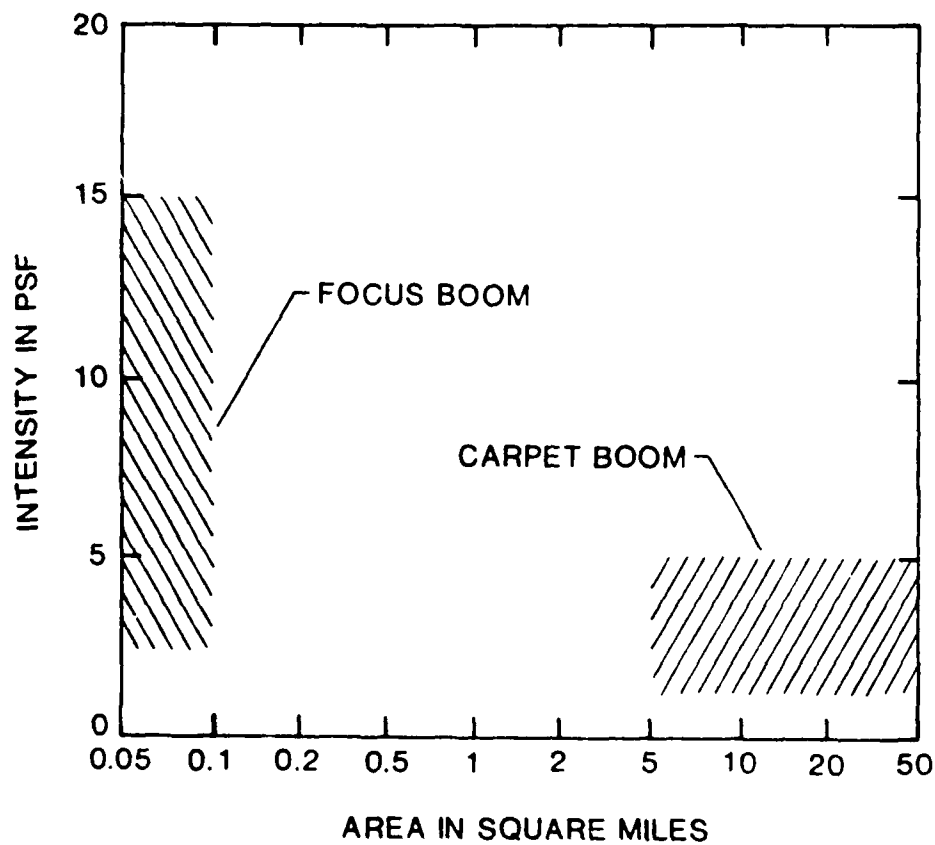


Figure B-1. Sonic Boom Area and Intensity for Typical F-15 Air Combat Maneuvering

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Table B-1

Comparison of the Effects of Carpet and Focus Booms to Yearly CLDN for 1978

Boom Type	Township Data		Supersonic Event Data			
	Township Name	Area (sq. mi.)	Number of Events (per year)	Average Pressure (psf)	Average Carpet Area (sq. mi.)	Yearly CLDN (dB)
Carpet	Las Vegas	1642	121	3.58	74.8	45.5
Focus	Las Vegas	1642	121	10.74	0.1	26.3
			Energy Average Yearly CLDN			45.6
Carpet	Caliente	3066	3554	2.33	79.0	54.0
Focus	Caliente	3066	3554	6.99	0.1	34.5
			Energy Average Yearly CLDN			54.0
Carpet	Logan	73	.28	2.31	75.7	28.7
Focus	Logan	73	.28	6.93	0.1	9.7
			Energy Average Yearly CLDN			28.8

APPENDIX C

This appendix contains the worksheets which present the calculations used to estimate the number of supersonic events of fighter aircraft in the TFWC for the years 1969 to 1983.

Table C-1

YEAR: 1969

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	5735	.23	1319
		F100	2057	.14	288
		F105	2805	.40	1122
		F111	398	.19	76
	Training Combat Exercises	F4	1911	.03	57
		F100	685	.01	7
		F105	935	.04	37
		F111	132	.19	25
474 TFW	Training Combat Exercises	F111	12833	.19	2438
Other ⁽¹⁾	Other		2749	.19	522
			<hr/>	<hr/>	<hr/>
	TOTAL:		30240	.19	5891

(1) 10% of total sorties flown, to account for testing and special routines

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Table C-2

YEAR: 1970

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	5669	.23	1304
		F105	2978	.40	1191
		F111	154	.19	29
	Training Combat Exercises	F4	1889	.03	57
		F105	993	.04	40
		F111	51	.19	10
474 TFW	Training Combat Exercises	F111	3153	.19	599
Other ⁽¹⁾	Other		1489	.19	283
TOTAL:			16376	.21	3513

(1) 10% of total sorties flown, to account for testing and special routines

Table C-3

YEAR: 1971

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	6533	.23	1503
		F105	1797	.40	719
		F111	451	.19	86
	Training Combat Exercises	F4	2178	.03	65
		F105	599	.04	24
		F111	150	.19	29
474 TFW	Training Combat Exercises	F111	11144	.19	2117
Other ⁽¹⁾	Other		2285	.19	434
			<hr/>	<hr/>	<hr/>
	TOTAL:		25137	.20	4977

(1) 10% of total sorties flown, to account for testing and special routines

Table C-4

YEAR: 1972

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	6044	.23	1390
		F105	1149	.40	460
		F111	470	.19	89
	Training Combat Exercises	F4	2015	.03	60
		F105	383	.04	15
		F111	156	.19	30
474 TFW	Training Combat Exercises	F111	8699	.19	1653
Other ⁽¹⁾	Other		1892	.19	359
			<hr/>	<hr/>	<hr/>
	TOTAL:		20808	.19	4056

(1) 10% of total sorties flown, to account for testing and special routines

AD-A170 986

EXPLORATORY STUDY OF THE POTENTIAL EFFECTS OF EXPOSURE
TO SONIC BOOM ON H. (U) SYSTEMS RESEARCH LABS INC
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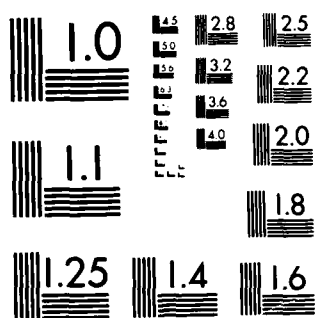
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Table C-5

YEAR: 1973

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	5387	.23	1239
		F105	1656	.40	662
		F111	485	.19	92
		T38	2352	.38	894
	Training Combat Exercises	F4	1796	.03	54
		F105	552	.04	22
		F111	162	.19	31
		T38	784	.03	24
474 TFW	Training Combat Exercises	F111	5097	.19	968
Other ⁽¹⁾	Other		1827	.19	347
TOTAL:			20098	.22	4333

(1) 10% of total sorties flown, to account for testing and special routines

Table C-6

YEAR: 1974

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	4836	.23	1112
		F105	1398	.40	559
		F111	443	.19	84
		T38	4212	.38	1601
	Training Combat Exercises	F4	1612	.03	48
		F105	466	.04	19
		F111	148	.19	28
		T38	1404	.03	42
474 TFW	Training Combat Exercises	F111	4759	.19	904
Other (1)	Other		1928	.19	366
TOTAL:			21206	.22	4763

(1) 10% of total sorties flown, to account for testing and special routines

Table C-7

YEAR: 1975

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	4657	.23	1071
		F5	98	.38	37
		F105	497	.40	199
		F111	606	.19	115
		T38	4238	.38	1610
	Training Combat Exercises	F4	1552	.03	47
		F5	5	.03	-
		F105	166	.04	7
		F111	202	.19	38
		T38	1427	.03	43
474 TFW	Training Combat Exercises	F111	4808	.19	914
57 FWW	Red Flag Large Scale Combat Exercises	F5	28	.03	1
474 TFW	↓	-	-	-	-
Other	↓	F4	332	.03	10
		RF4C	50	.02	1
Other (1)	Other		1867	.19	355
TOTAL:			20533	.22	4448

(1) 10% of total sorties flown, to account for testing and special routines

Table C-8

YEAR: 1976

Wing	Operation	Aircraft Type	Sorties Flown	Supersonic Events Per Sortie	Number of Supersonic Events
57 FWW	Training Air-to-Air	F4	3666	.23	843
		F5	4385	.38	1666
		F15	212	.43	91
		F111	276	.19	52
		T38	3255	.38	1237
	Training Combat Exercises	F4	1210	.03	36
		F5	761	.03	23
		F15	70	.21	15
		F111	92	.19	17
		T38	1085	.03	33
474 TFW	Training Combat Exercises	F111	7951	.19	1511
57 FWW	Red Flag Large Scale Combat Exercises	F4	12	.03	-
		F5	701	.03	21
474 TFW	↓	F111	22	.19	4
Other		F4	1840	.03	55
		F15	959	.21	201
		F100	537	.01	5
		F106	97	.23	22
		F111	322	.19	61
		RF4C	492	.02	10
Other (1)	Other		2795	.19	531
Special (2)	ACEVAL/ AIMVAL	F-14 F-15	800	.21	168
TOTAL:			31540	.21	6602

(1) 10% of total sorties flown, to account for testing and special routines

(2) ACEVAL/AIMVAL data was obtained from an Environmental Impact Statement and was not included in the 10%

Table C-9

YEAR: 1977

Wing	Operation	Aircraft Type	Sorties Flown	Supersonic Events Per Sortie	Number of Supersonic Events
57 FWW	Training Air-to-air	F4	3170	.23	729
		F5	8399	.38	3192
		F15	1967	.43	846
		F111	212	.19	40
		T38	1824	.38	693
	Training Combat Exercises	F4	1025	.03	31
		F5	1801	.03	54
		F15	656	.21	138
		F111	70	.19	13
		T38	607	.03	18
474 TFW	Training Combat Exercises	F4	3270	.03	98
		F111	3242	.19	616
57 FWW	Red Flag Large Scale Combat Exercises	F4	31	.03	1
		F5	998	.03	30
474 TFW	↓	F111	139	.19	26
Other		F4	2958	.03	89
		F5	122	.03	4
		F14	25	.35	9
		F15	1599	.21	33
		F100	964	.01	10
		F104	143	.04	6
		F106	142	.23	33
		F111	686	.19	130
RF4C		824	.02	16	
Other (1)	Other		3487	.19	663
Special (2)	ACEVAL/AIMVAL	F14-F15	2300	.21	483
TOTAL:			40661	.20	8001

(1) 10% of total sorties flown, for testing and special routines

(2) ACEVAL/AIMVAL data was obtained from an Environmental Impact Statement and was not included in the 10%

Table C-10

YEAR: 1978

YEAR: 1978					
<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	3233	.23	744
		F5	9607	.38	3651
		F15	1839	.43	791
	Training Combat Exercises	F4	1077	.03	32
		F5	1974	.03	59
		F15	606	.21	127
474 TFW	Training Combat Exercises	F4	9136	.03	274
57 FWW	Red Flag Large Scale Combat Exercises	F5	1229	.03	37
		F15	7	.21	1
474 TFW	↓	F4	1081	.03	32
Other		F4	3369	.03	101
		F5	6	.03	-
		F14	18	.35	6
		F15	2201	.21	462
		F100	605	.01	6
		F106	257	.23	59
		F111	569	.19	108
		RF4C	565	.02	11
Other (1)	Other		3738	.19	1026
TOTAL:			41117	.18	7527

(1) 10% of total sorties flown, for testing and special routines

Table C-11

YEAR: 1979

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	3124	.23	719
		F5	9917	.38	3768
		F15	2006	.43	863
	Training Combat Exercises	F4	1013	.03	30
		F5	2191	.03	66
		F15	643	.21	135
474 TFW	Training Combat Exercises	F4	10211	.03	306
57 FWW	Red Flag Large Scale Combat Exercises	F4	28	.03	-
		F5	1114	.03	33
		F15	25	.21	5
474 TFW	↓	F4	436	.03	13
Other		F4	3512	.03	105
		F5	282	.03	8
		F14	122	.35	43
		F15	1778	.21	373
		F16	93	.03	3
		F100	26	.01	-
		F104	111	.04	4
		F106	360	.23	83
		F111	860	.19	163
		RF4C	571	.02	11
Other (1)	Other		3842	.19	730
TOTAL:			42265	.18	7461

(1) 10% of total sorties flown, for testing and special routines

Table C-12

YEAR: 1980

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	3255	.23	749
		F5	10137	.38	3852
		F15	2205	.43	948
		F16	152	.24	36
	Training Combat Exercises	F4	1085	.03	33
		F5	1996	.03	60
		F15	730	.21	153
		F16	50	.03	2
474 TFW	Training Combat Exercises	F4	10465	.03	314
		F16	104	.03	3
	57 FWW	Red Flag Large Scale Combat Exercises	F5	1383	.03
F15			5	.21	1
F16			1	.03	-
474 TFW	↓	F4	88	.03	3
Other		F4	2367	.03	71
		F5	281	.03	8
		F15	1432	.21	301
		F16	133	.03	4
		F106	216	.23	50
		F111	712	.19	135
		RF4C	535	.02	11
Other (1)	Other		3733	.19	709
TOTAL:			41065	.18	7484

(1) 10% of total sorties flown, for testing and special routines

Table C-13

YEAR: 1981

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	2951	.23	679
		F5	10146	.38	3855
		F15	2327	.43	1001
		F16	1102	.24	264
	Training Combat Exercises	F4	967	.03	29
		F5	2434	.03	73
		F15	774	.21	163
		F16	360	.03	11
474 TFW	Training Combat Exercises	F4	2164	.03	65
		F16	10177	.03	305
	57 FWW	Red Flag Large Scale Combat Exercises	F4	17	.03
F5			948	.03	28
F15			1	.21	-
F16			7	.03	-
474 TFW	↓	F16	16	.03	-
Other		F4	4282	.03	128
		F5	499	.03	15
		F14	49	.35	17
		F15	1723	.21	362
		F16	445	.03	13
		F104	11	.04	-
		F106	152	.23	35
		F111	452	.19	86
		RF4C	420	.02	8
Other (1)	Other		4242	.19	806
TOTAL:			46666	.17	7944

(1) 10% of total sorties flown, for testing and special routines

Table C-14

YEAR: 1982

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-Air	F4	2351	.23	541
		F5	9941	.38	3778
		F15	2169	.43	933
		F16	2178	.24	523
	Training Combat Exercises	F4	784	.03	24
		F5	2049	.03	61
		F15	722	.21	152
		F16	726	.03	22
474 TFW	Training Combat Exercises	F16	14896	.03	447
57 FWW	Red Flag Large Scale Combat Exercises	F5	1265	.03	38
		F15	1	.21	-
474 TFW		F16	284	.03	9
Other	↓	F4	4191	.03	126
		F14	55	.35	19
		F15	1739	.21	365
		F16	56	.03	2
		F106	92	.23	21
		F111	1034	.19	196
		RF4C	741	.02	15
Other ⁽¹⁾	Other		4527	.19	861
TOTAL:			49801	.16	8133

(1) 10% of total sorties, for testing and special routines

Table C-15

YEAR: 1983

<u>Wing</u>	<u>Operation</u>	<u>Aircraft Type</u>	<u>Sorties Flown</u>	<u>Supersonic Events Per Sortie</u>	<u>Number of Supersonic Events</u>
57 FWW	Training Air-to-air	F4	2226	.23	512
		F5	10077	.38	3829
		F15	2491	.43	1071
		F16	3023	.24	726
	Training Combat Exercises	F4	742	.03	22
		F5	1964	.03	59
		F15	831	.21	175
		F16	1007	.03	30
474 TFW	Training Combat Exercises	F16	14316	.03	429
57 FWW	Red Flag Large Scale Combat Exercises	F5	1395	.03	42
474 TFW		F16	543	.03	16
Other	↓	F4	3065	.03	92
		F5	327	.03	10
		F15	1666	.21	350
		F16	669	.03	20
		F18	381	.30	114
		F106	219	.23	50
		F111	719	.19	137
		RF4C	728	.02	15
Other ⁽¹⁾	Other		4639	.19	874
TOTAL:			51028	.17	8573

(1) 10% of total sorties flown, for testing and special routines

APPENDIX D

This appendix presents the detailed data on estimated sonic boom environments for each year from 1969 to 1983 throughout the State of Nevada. The ordinates are broken down by:

- o Each year
- o Tactical fighter aircraft, SR-71 aircraft, or both
- o Townships

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Table D-1a

1969 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.00	0.00	0.0	0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0	0.0	0.000
03	BUNKERVILLE	109	0.30	1.60	72.0	24.1	0.005
04	GOODSPRINGS	1095	0.60	1.60	72.0	17.0	0.010
05	HENDERSON	219	0.67	1.60	72.0	24.5	0.011
06	LAS VEGAS	1642	99.00	1.60	72.0	37.5	1.666
07	LOGAN	73	0.20	1.60	72.0	24.0	0.003
08	MESQUITE	219	0.60	1.60	72.0	24.0	0.010
09	MOAPA	1533	676.00	1.60	72.0	46.1	11.375
10	NELSON	730	2.00	1.60	72.0	24.0	0.034
11	N LAS VEGAS	511	2.18	1.60	72.0	26.0	0.037
12	QVERTON	1131	3.10	1.60	72.0	24.0	0.052
13	SEARCHLIGHT	803	2.14	1.60	72.0	23.9	0.036
15	EAST FORK	730	0.00	0.00	0.0	0.0	0.000
16	TAHOE	36	0.00	0.00	0.0	0.0	0.000
18	CARLIN	1606	1.86	1.60	72.0	20.3	0.031
19	EAST LINE	1533	0.00	0.00	0.0	0.0	0.000
20	ELKO	3467	6.32	1.60	72.0	22.3	0.106
21	JACKPOT	1168	1.53	1.60	72.0	20.8	0.026
22	JARRIDGE	365	1.70	1.60	72.0	26.3	0.029
23	MOUNTAIN CITY	3066	7.68	1.60	72.0	23.6	0.129
24	TECOMA	2043	0.00	0.00	0.0	0.0	0.000
25	WELLS	4161	3.91	1.60	72.0	19.4	0.066
27	ESMERALDA	3503	0.00	0.00	0.0	0.0	0.000
28	BEOVAWE	1387	0.00	0.00	0.0	0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0	0.0	0.000
31	GOLD RUN	1424	0.17	1.60	72.0	10.4	0.003
32	MCDERMITT	1533	0.42	1.60	72.0	14.0	0.007
33	PARADISE VALY	1387	0.38	1.60	72.0	14.0	0.006
34	UNION	5621	4.89	1.60	72.0	19.1	0.082
36	ARGENTA	2519	0.00	0.00	0.0	0.0	0.000
37	AUSTIN	3138	0.00	0.00	0.0	0.0	0.000
39	ALAMO	3941	1434.00	1.60	72.0	45.3	24.129
40	CALIENTE	3066	2902.00	1.66	72.2	49.7	48.831
41	PANACA	621	161.00	1.66	72.2	44.1	2.709
42	PLOCHE	2737	106.00	1.66	72.2	35.9	1.784
44	CANAL	182	0.00	0.00	0.0	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0	0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.0	0.000
49	HATHORNE	1971	0.00	0.00	0.0	0.0	0.000
50	MINA	1387	0.00	0.00	0.0	0.0	0.000
51	SCHURZ	401	0.00	0.00	0.0	0.0	0.000
53	BEATTY	4526	227.00	2.20	76.9	39.7	3.820
54	GABBS	1569	0.00	0.00	0.0	0.0	0.000
55	PAHRUMP	292	1.16	1.69	73.4	26.2	0.020
56	ROUND MNTAIN	730	0.00	0.00	0.0	0.0	0.000
57	TONOPAH	10183	286.00	2.57	77.5	38.6	4.812
59	LAKE	5984	0.64	1.60	72.0	9.9	0.011
60	VIRGINIA	219	0.00	0.00	0.0	0.0	0.000
61	GERLACH	4343	9.18	1.45	65.4	21.7	0.154
62	RENO	766	0.10	1.60	72.0	10.8	0.002
63	SPARKS	621	0.12	1.60	72.0	12.5	0.002
64	VFRDI	73	0.00	0.00	0.0	0.0	0.000
65	WADSWORTH	730	0.10	1.60	72.0	11.0	0.002
67	BAKER	1168	0.00	0.00	0.0	0.0	0.000
68	ELY	7190	0.00	0.00	0.0	0.0	0.000
69	LUND	694	0.00	0.00	0.0	0.0	0.000
TOTAL		109889	5942.95				100.000

Table D-1b

1969 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude >20k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	0.16	0.80	3650.0	17.1	0.050
02	NEW RIVER	5036	3.89	0.80	3650.0	29.6	1.210
03	BUNKERVILLE	109	0.00	0.00	0.0	0.0	0.000
04	GOODSPRINGS	1095	1.80	0.80	3650.0	27.6	0.560
05	HENDERSON	219	0.14	0.80	3650.0	16.5	0.044
06	LAS VEGAS	1642	2.27	0.80	3650.0	28.6	0.706
07	LOGAN	73	0.00	0.00	0.0	0.0	0.000
08	MESQUITE	219	0.00	0.00	0.0	0.0	0.000
09	MOAPA	1533	1.30	0.80	3650.0	26.2	0.404
10	NELSON	730	0.54	0.80	3650.0	22.4	0.168
11	N LAS VEGAS	511	0.30	0.80	3650.0	19.8	0.093
12	OVERTON	1131	0.00	0.00	0.0	0.0	0.000
13	SEARCHLIGHT	803	0.81	0.80	3650.0	24.1	0.252
15	EAST FORK	730	1.08	0.80	3650.0	25.4	0.336
16	TAHOE	36	0.04	0.80	3650.0	11.1	0.012
18	CARLIN	1606	1.55	0.80	3650.0	27.0	0.482
19	EAST LINE	1533	1.68	0.80	3650.0	27.3	0.523
20	ELKO	3467	0.79	0.80	3650.0	24.0	0.246
21	JACKPOT	1168	0.32	0.80	3650.0	20.1	0.100
22	JARBRIDGE	365	0.10	0.80	3650.0	15.1	0.031
23	MOUNTAIN CITY	3066	3.24	0.80	3650.0	30.2	1.008
24	TECOMA	2043	0.65	0.80	3650.0	23.2	0.202
25	WELLS	4161	1.96	0.80	3650.0	27.4	0.610
27	ESMERALDA	3503	1.89	0.80	3650.0	27.8	0.588
28	BEOHAVE	1387	0.00	0.00	0.0	0.0	0.000
29	EUREKA	2773	5.20	0.80	3650.0	32.2	1.618
31	GOLD RUN	1424	0.78	0.80	3650.0	24.0	0.243
32	MCDERMITT	1533	0.52	0.80	3650.0	22.2	0.162
33	PARADISE VALY	1387	0.76	0.80	3650.0	23.9	0.236
34	UNION	5621	13.82	0.80	3650.0	34.6	4.299
36	ARGENTA	2519	0.56	0.80	3650.0	22.5	0.174
37	AUSTIN	3138	4.36	0.80	3650.0	31.5	1.356
39	ALAMO	3941	3.37	0.80	3650.0	30.0	1.048
40	CALIENTE	3066	2.07	0.80	3650.0	28.2	0.644
41	PANACA	621	0.51	0.80	3650.0	22.1	0.159
42	PIOCHE	2737	4.81	0.80	3650.0	31.9	1.496
44	CANAL	182	0.20	0.80	3650.0	18.1	0.062
45	DAYTON	438	0.48	0.80	3650.0	21.9	0.149
46	MASON VALLEY	876	1.11	0.80	3650.0	25.5	0.345
47	SMITH VALLEY	474	0.70	0.80	3650.0	23.5	0.218
49	HATHORNE	1971	1.65	0.80	3650.0	27.2	0.513
50	MINA	1387	0.78	0.80	3650.0	24.0	0.243
51	SCHURZ	401	0.33	0.80	3650.0	20.2	0.103
53	BEATTY	4526	6.88	0.80	3650.0	32.5	2.140
54	GARBS	1569	0.26	0.80	3650.0	19.2	0.081
55	FAHRUMP	292	0.48	0.80	3650.0	21.9	0.149
56	ROUND MNTAIN	730	0.08	0.80	3650.0	14.1	0.025
57	TONOPAH	10183	6.14	0.80	3650.0	28.5	1.910
59	LAKE	5984	135.37	0.80	3650.0	44.2	42.110
60	VIRGINIA	219	0.24	0.80	3650.0	18.9	0.075
61	GERLACH	4343	75.99	0.80	3639.9	43.1	23.638
62	RENO	766	7.89	0.80	3650.0	34.0	2.454
63	SPARKS	621	9.14	0.80	3650.0	34.7	2.843
64	VERDI	73	0.08	0.80	3650.0	14.1	0.025
65	WADSWORTH	730	7.85	0.80	3650.0	34.0	2.442
67	BAKER	1168	1.19	0.80	3650.0	25.8	0.370
68	ELY	7190	3.29	0.80	3650.0	27.3	1.023
69	LUND	694	0.07	0.80	3650.0	13.5	0.022
TOTAL		109889	321.47				100.000

Table D-1c

1969 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.16	0.80	0.0	17.2	0.003
02	NEW RIVER	5036	3.99	0.80	0.0	29.6	0.062
03	BUNKERVILLE	109	0.30	1.60	0.0	24.1	0.005
04	GOODSPRINGS	1095	2.40	1.00	0.0	28.0	0.038
05	HENDERSON	219	0.81	1.46	0.0	25.2	0.013
06	LAS VEGAS	1642	101.27	1.45	0.0	38.0	1.617
07	LUGAN	73	0.20	1.60	0.0	24.0	0.003
08	MESQUITE	219	0.60	1.60	0.0	24.0	0.010
09	MOAPA	1533	677.30	1.48	0.0	46.1	10.812
10	NELSON	730	2.54	1.43	0.0	26.3	0.041
11	N LAS VEGAS	511	2.48	1.50	0.0	26.9	0.040
12	OVERTON	1131	3.10	1.60	0.0	24.1	0.049
13	SLACHT LIGHT	803	2.95	1.38	0.0	27.0	0.047
15	EAST FORN	730	1.08	0.80	0.0	25.4	0.017
16	TAHOE	36	0.04	0.80	0.0	11.4	0.001
18	CARLIN	1606	3.41	1.24	0.0	27.8	0.054
19	EAST LINE	1533	1.68	0.80	0.0	27.3	0.027
20	ELKO	3467	7.11	1.51	0.0	26.3	0.113
21	JACKPOT	1168	1.85	1.46	0.0	23.5	0.030
22	JARRIDGE	365	1.80	1.56	0.0	26.6	0.029
23	MOUNTAIN CITY	3066	10.92	1.36	0.0	31.0	0.174
24	TEHOMA	2043	0.65	0.80	0.0	23.2	0.010
25	WELLS	4161	5.87	1.33	0.0	28.1	0.094
27	ESMERALDA	3503	1.89	0.80	0.0	27.8	0.030
28	REDWAVE	1387	0.00	0.00	0.0	0.0	0.000
29	EUREKA	2773	5.20	0.80	0.0	32.2	0.083
31	GOLD RUN	1424	0.95	0.94	0.0	24.2	0.015
32	MACDERMOTT	1533	0.94	1.16	0.0	22.8	0.015
33	PARADISE VALLEY	1387	1.14	1.07	0.0	24.3	0.018
34	UNION	5621	18.71	1.01	0.0	34.7	0.297
36	ARGENTA	2519	0.56	0.80	0.0	22.6	0.009
37	AUSTIN	3138	4.36	0.80	0.0	31.5	0.070
39	ALAMO	3941	1437.37	1.46	0.0	45.4	22.945
40	CALIENTE	3066	2994.07	1.61	0.0	49.8	46.358
41	PANACA	621	161.51	1.61	0.0	44.2	2.578
42	PIOCHE	2737	110.81	1.26	0.0	37.3	1.769
44	CANAL	182	0.20	0.80	0.0	18.1	0.003
45	DAYTON	438	0.48	0.80	0.0	21.9	0.008
46	MASON VALLEY	876	1.11	0.80	0.0	25.5	0.018
47	SMITH VALLEY	474	0.70	0.80	0.0	23.5	0.011
49	BATHURNE	1971	1.65	0.80	0.0	27.2	0.026
50	MINA	1387	0.78	0.80	0.0	24.0	0.012
51	CHURCH	401	0.33	0.80	0.0	20.3	0.005
53	BEATTY	4526	233.88	1.57	0.0	40.5	3.743
54	GARBS	1569	0.26	0.80	0.0	19.3	0.004
55	FAHRUMP	292	1.64	1.43	0.0	27.6	0.026
56	ROUND MOUNTAIN	730	0.08	0.80	0.0	14.3	0.001
57	TONOPAH	10183	292.14	1.42	0.0	39.0	4.663
59	LAKE	5984	136.01	0.80	0.0	44.2	2.171
60	VIRGINIA	219	0.24	0.80	0.0	18.9	0.004
61	GERLACH	4343	85.17	0.87	0.0	43.1	1.660
62	RENO	766	7.99	0.81	0.0	34.1	0.128
63	SPARKS	621	9.26	0.81	0.0	34.7	0.148
64	VERDI	73	0.08	0.80	0.0	14.3	0.001
65	WADSWORTH	730	7.95	0.81	0.0	34.0	0.127
67	BAKER	1168	1.19	0.80	0.0	25.8	0.019
68	ELY	7190	3.29	0.80	0.0	27.3	0.053
69	LUND	694	0.07	0.80	0.0	13.7	0.001
TOTAL		109889	6264.42				100.000

Table D-2a

1970 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLIN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.00	0.00	0.0		0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0		0.0	0.000
03	BUNKERVILLE	109	0.03	1.60	72.0		14.1	0.001
04	GOODSPRINGS	1095	2.10	1.60	72.0		22.5	0.059
05	HENDERSON	219	0.28	1.60	72.0		20.7	0.008
06	LAS VEGAS	1642	59.00	1.60	72.0		35.2	1.665
07	LOGAN	73	0.02	1.60	72.0		14.0	0.001
08	MESQUITE	219	0.06	1.60	72.0		14.0	0.002
09	MOAPA	1533	403.00	1.60	72.0		43.9	11.375
10	NELSON	730	1.70	1.60	72.0		23.3	0.048
11	N LAS VEGAS	511	0.44	1.60	72.0		19.0	0.012
12	VERTON	1131	0.31	1.60	72.0		14.0	0.009
13	SEARCHLIGHT	803	2.39	1.60	72.0		24.4	0.067
15	EAST FORK	730	0.00	0.00	0.0		0.0	0.000
16	TAHOE	36	0.00	0.00	0.0		0.0	0.000
18	CARLIN	1606	0.93	1.60	72.0		17.3	0.026
19	EAST LINE	1533	0.00	0.00	0.0		0.0	0.000
20	ELKO	3467	2.31	1.60	72.0		17.9	0.065
21	JACKPOT	1168	0.54	1.60	72.0		16.3	0.015
22	JARRIDGE	365	0.60	1.60	72.0		21.8	0.017
23	MOUNTAIN CITY	3066	3.24	1.60	72.0		19.9	0.091
24	TECOMA	2043	0.00	0.00	0.0		0.0	0.000
25	WELLS	4161	1.38	1.60	72.0		14.9	0.039
27	ESMERALDA	3503	0.00	0.00	0.0		0.0	0.000
28	BEOWAWE	1387	0.00	0.00	0.0		0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0		0.0	0.000
31	GOLD RUN	1424	0.17	1.60	72.0		10.4	0.005
32	MCDERMITT	1533	0.42	1.60	72.0		14.0	0.012
33	PARADISE VALY	1387	0.38	1.60	72.0		14.0	0.011
34	UNION	5621	1.64	1.60	72.0		14.3	0.046
36	ARGENTA	2519	0.00	0.00	0.0		0.0	0.000
37	AUSTIN	3138	0.00	0.00	0.0		0.0	0.000
39	ALAMO	3941	856.00	1.60	72.0		43.0	24.163
40	CALIENTE	3066	1730.00	1.60	72.0		47.2	48.935
41	PANACA	621	96.00	1.60	72.0		41.5	2.210
42	PIOCHE	2737	63.00	1.60	72.0		33.3	1.728
44	CANAL	182	0.00	0.00	0.0		0.0	0.000
45	DAYTON	438	0.00	0.00	0.0		0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0		0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0		0.0	0.000
49	HATHORNE	1971	0.00	0.00	0.0		0.0	0.000
50	MINA	1387	0.00	0.00	0.0		0.0	0.000
51	SCHURZ	401	0.00	0.00	0.0		0.0	0.000
53	BEATTY	4526	135.00	1.60	72.0		34.4	3.811
54	GABBS	1569	0.00	0.00	0.0		0.0	0.000
55	PAHRUMP	292	0.24	1.60	72.0		18.8	0.007
56	ROUND MNTAIN	730	0.00	0.00	0.0		0.0	0.000
57	TONOPAH	10183	171.00	1.60	72.0		31.9	4.307
59	LAKE	5984	6.37	1.60	72.0		19.9	0.180
60	VIRGINIA	219	0.00	0.00	0.0		0.0	0.000
61	GERLACH	4343	3.06	1.60	72.0		18.1	0.086
62	RENO	766	0.30	1.60	72.0		15.6	0.003
63	SPARKS	621	0.36	1.60	72.0		17.3	0.013
64	VERDI	73	0.00	0.00	0.0		0.0	0.000
65	WADSWORTH	730	0.30	1.60	72.0		15.8	0.008
67	BAKER	1168	0.00	0.00	0.0		0.0	0.000
68	ELY	7190	0.00	0.00	0.0		0.0	0.000
69	LUND	694	0.00	0.00	0.0		0.0	0.000
TOTAL		109889	3542.57					100.000

Table D-2b

1970 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	1.44	0.80	3650.0	26.6	0.419
02	NEW RIVER	5036	18.32	0.80	3650.0	36.3	5.331
03	BUNKERVILLE	109	0.03	0.80	3650.0	9.8	0.009
04	GOODSPRINGS	1095	12.00	0.80	3650.0	35.9	3.492
05	HENDERSON	219	0.57	0.80	3650.0	22.6	0.166
06	LAS VEGAS	1642	1.23	0.80	3650.0	26.0	0.358
07	LOGAN	73	0.02	0.80	3650.0	8.1	0.006
08	MESQUITE	219	0.06	0.80	3650.0	12.8	0.017
09	MOAPA	1533	0.42	0.80	3650.0	21.3	0.122
10	NELSON	730	2.81	0.80	3650.0	29.5	0.818
11	N LAS VEGAS	511	0.14	0.80	3650.0	16.5	0.041
12	OVERTON	1131	0.31	0.80	3650.0	20.0	0.090
13	SEARCHLIGHT	803	4.21	0.80	3650.0	31.3	1.225
14	EAST FORK	730	5.24	0.80	3650.0	32.3	1.525
15	TAHOE	36	0.36	0.80	3650.0	20.6	0.105
16	CARLIN	1606	2.37	0.80	3650.0	28.8	0.690
17	EAST LINE	1533	1.26	0.80	3650.0	26.1	0.367
18	ELKO	3467	10.32	0.80	3650.0	35.2	3.003
19	JACKPOT	1168	0.82	0.80	3650.0	24.2	0.239
20	HARRIDGE	365	0.40	0.80	3650.0	21.1	0.116
21	MOUNTAIN CITY	3066	3.36	0.80	3650.0	30.3	0.938
22	TRINOMA	2043	1.15	0.80	3650.0	25.7	0.435
23	WELLS	4161	7.92	0.80	3650.0	33.5	2.305
24	ESMERALTA	3503	9.58	0.80	3650.0	34.9	2.488
25	BENDWAVE	1387	1.90	0.80	3650.0	27.8	0.553
26	FOURKA	2773	7.96	0.80	3650.0	34.1	2.316
27	GOLD RUN	1424	1.83	0.80	3650.0	27.7	0.533
28	MCDERMITT	1533	1.10	0.80	3650.0	25.5	0.340
29	PARADISE VALY	1387	1.14	0.80	3650.0	25.6	0.332
30	UNION	5621	8.14	0.80	3650.0	32.3	2.369
31	ARGENTA	2519	3.73	0.80	3650.0	30.8	1.085
32	AUSTIN	3138	15.42	0.80	3650.0	36.9	4.487
33	ALAMO	3941	0.14	0.80	3650.0	16.2	0.041
34	CALIENTE	3066	0.83	0.80	3650.0	24.3	0.242
35	PANACA	621	0.17	0.80	3650.0	17.4	0.049
36	PIUCHE	2737	0.11	0.80	3650.0	15.5	0.032
37	CANAL	182	1.80	0.80	3650.0	27.6	0.524
38	DAYTON	438	4.32	0.80	3650.0	31.4	1.257
39	MASON VALLEY	876	4.83	0.80	3650.0	31.9	1.406
40	SMITH VALLEY	474	3.42	0.80	3650.0	30.4	0.925
41	HATHORNE	1971	0.87	0.80	3650.0	24.5	0.253
42	MINA	1387	0.58	0.80	3650.0	22.7	0.169
43	SCHURZ	401	0.35	0.80	3650.0	20.5	0.102
44	BEATY	4526	15.04	0.80	3650.0	35.9	4.377
45	GARBS	1569	1.83	0.80	3650.0	27.7	0.533
46	FAHRUMP	292	0.80	0.80	3650.0	24.1	0.233
47	ROUND MNTAIN	730	0.80	0.80	3650.0	24.1	0.233
48	TUNOPAH	10183	8.22	0.80	3650.0	29.8	2.392
49	LAKE	5984	68.00	0.80	3650.0	41.2	19.283
50	VIRGINIA	219	2.16	0.80	3650.0	28.4	0.629
51	GERLACH	4343	63.75	0.80	3638.0	42.3	18.551
52	BEND	766	11.81	0.80	3650.0	35.8	3.437
53	FRANKS	621	11.22	0.80	3650.0	35.6	3.265
54	VERDI	73	0.72	0.80	3650.0	23.6	0.210
55	WADSWORTH	730	11.45	0.80	3650.0	35.6	3.332
56	BAKER	1168	0.00	0.00	0.0	0.0	0.000
57	ELY	2190	4.80	0.80	3650.0	28.9	1.397
58	LUND	694	0.06	0.80	3650.0	12.8	0.017
TOTAL		109889	343.64				100.000

Table D-2c

1970 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1->30k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	1.44	0.80	0.0		26.7	0.037
02	NEW RIVER	5036	18.32	0.80	0.0		36.3	0.471
03	BUNKERVILLE	109	0.06	1.20	0.0		15.4	0.002
04	GOODSPRINGS	1095	14.10	0.92	0.0		36.0	0.363
05	HENDERSON	219	0.85	1.06	0.0		24.8	0.022
06	LAS VEGAS	1642	60.23	1.35	0.0		35.7	1.550
07	LOGAN	73	0.04	1.20	0.0		15.0	0.001
08	MESQUITE	219	0.12	1.20	0.0		16.5	0.003
09	MOAPA	1533	403.42	1.44	0.0		43.9	10.381
10	NELSON	730	4.51	1.10	0.0		30.5	0.116
11	N LAS VEGAS	511	0.58	1.41	0.0		20.9	0.015
12	OVERTON	1131	0.62	1.20	0.0		21.0	0.016
13	SEARCHLIGHT	803	6.60	1.09	0.0		32.1	0.170
15	EAST FORK	730	5.24	0.80	0.0		32.3	0.135
16	TAHOE	36	0.36	0.80	0.0		29.7	0.009
18	CARLIN	1606	3.30	1.03	0.0		29.1	0.035
19	EAST LINE	1533	1.26	0.80	0.0		26.1	0.032
20	ELKO	3467	12.63	0.95	0.0		35.3	0.325
21	JACKPOT	1168	1.36	1.12	0.0		24.9	0.035
22	JARBRIDGE	365	1.00	1.28	0.0		24.5	0.026
23	MOUNTAIN CITY	3066	6.60	1.19	0.0		30.7	0.170
24	TECOMA	2043	1.15	0.80	0.0		25.7	0.030
25	WELLS	4161	9.30	0.92	0.0		33.5	0.249
27	ESMERALDA	3503	9.58	0.80	0.0		34.9	0.247
28	BEOWAWE	1387	1.90	0.80	0.0		27.9	0.049
29	EUREKA	2773	7.96	0.80	0.0		34.1	0.205
31	GOLD RUN	1424	2.00	0.87	0.0		27.8	0.051
32	MCDERMOTT	1533	1.52	1.02	0.0		25.8	0.039
33	PARADISE VALY	1387	1.52	1.00	0.0		25.9	0.039
34	UNION	5621	9.78	0.93	0.0		32.4	0.252
36	ARGENTA	2519	3.73	0.80	0.0		30.8	0.076
37	AUSTIN	3138	15.42	0.80	0.0		36.9	0.397
39	ALAMO	3941	856.14	1.49	0.0		43.0	22.030
40	CALIENTE	3066	1730.83	0.92	0.0		47.2	44.538
41	PANACA	621	96.17	0.92	0.0		41.5	2.425
42	PIOCHE	2737	63.11	0.92	0.0		33.4	1.624
44	CANAL	182	1.80	0.80	0.0		27.6	0.046
45	DAYTON	438	4.32	0.80	0.0		31.4	0.111
46	MASON VALLEY	876	4.83	0.80	0.0		31.9	0.124
47	SMITH VALLEY	474	3.42	0.80	0.0		30.4	0.088
49	HATHORNE	1971	0.87	0.80	0.0		24.5	0.022
50	MINA	1387	0.58	0.80	0.0		22.7	0.015
51	SCHURZ	401	0.35	0.80	0.0		20.5	0.009
53	BEATTY	4526	150.04	0.82	0.0		38.2	3.861
54	GABBS	1569	1.83	0.80	0.0		27.7	0.047
55	FAHRUMP	292	1.04	0.98	0.0		25.2	0.027
56	ROUND MNTAIN	730	0.80	0.80	0.0		24.1	0.021
57	TONOPAH	10183	179.22	0.92	0.0		34.0	4.612
59	LAKE	5984	74.37	0.87	0.0		41.3	1.914
60	VIRGINIA	219	2.16	0.80	0.0		28.4	0.056
61	GERLACH	4343	66.81	0.83	0.0		42.3	1.719
62	RENO	766	12.11	0.82	0.0		35.8	0.312
63	SPARKS	621	11.58	0.82	0.0		35.6	0.298
64	VERDI	73	0.72	0.80	0.0		23.7	0.019
65	WADSWORTH	730	11.75	0.82	0.0		35.7	0.302
67	BAKER	1168	0.00	0.00	0.0		0.0	0.000
68	ELY	7190	4.80	0.80	0.0		28.9	0.124
69	LUND	694	0.06	0.80	0.0		13.1	0.002
TOTAL		109889	3886.21					100.000

Table D-3a

1971 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1-30k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.00	0.00	0.0		0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0		0.0	0.000
03	BUNKERVILLE	109	0.03	1.60	72.0		14.1	0.001
04	GOODSPRINGS	1095	4.50	1.60	72.0		25.8	0.089
05	HENDERSON	219	1.22	1.61	72.0		27.2	0.034
06	LAS VEGAS	1642	84.00	1.60	72.0		36.7	1.670
07	LOGAN	73	0.02	1.60	72.0		14.0	0.000
08	MESQUITE	219	0.06	1.60	72.0		14.0	0.001
09	MOAPA	1533	571.00	1.60	72.0		45.4	11.349
10	NELSON	730	4.34	1.64	72.2		27.6	0.086
11	N LAS VEGAS	511	4.40	1.60	72.0		29.0	0.087
12	OVERTON	1131	0.31	1.60	72.0		14.0	0.006
13	SEARCHLIGHT	803	6.19	1.64	72.2		28.8	0.123
15	EAST FORK	730	0.14	1.60	72.0		12.5	0.003
16	TAHUE	36	0.00	0.00	0.0		0.0	0.000
18	CARLIN	1606	0.62	1.60	72.0		15.5	0.012
19	EAST LINE	1533	0.00	0.00	0.0		0.0	0.000
20	ELKO	3467	0.52	1.60	72.0		11.4	0.010
21	JACKPOT	1168	1.01	1.60	72.0		19.0	0.020
22	JARRIDGE	365	0.10	1.60	72.0		14.0	0.002
23	MOUNTAIN CITY	3066	1.44	1.60	72.0		16.4	0.029
24	TECUMA	2043	2.12	1.60	72.0		19.8	0.042
25	WELLS	4161	1.07	1.60	72.0		13.8	0.021
27	ESMERALDA	3503	5.57	2.12	70.4		24.0	0.111
28	KEOWAWE	1387	0.00	0.00	0.0		0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0		0.0	0.000
31	GOLD RUN	1424	0.39	1.60	72.0		14.0	0.003
32	MCDERMITT	1533	0.26	1.60	72.0		12.0	0.005
33	PARADISE VALY	1387	0.38	1.60	72.0		14.0	0.008
34	UNION	5621	0.63	1.60	72.0		10.2	0.013
36	ARGENTA	2519	0.28	1.60	72.0		10.1	0.006
37	AUSTIN	3138	0.00	0.00	0.0		0.0	0.000
39	ALAMO	3941	1213.00	2.19	73.5		47.4	24.110
40	CALLENTE	3066	2451.00	1.84	75.8		50.1	48.717
41	PANACA	621	136.00	1.84	75.8		44.5	2.703
42	PIECHE	2737	99.00	1.84	75.8		36.2	1.769
44	CANAL	182	0.00	0.00	0.0		0.0	0.000
45	DAYTON	438	0.00	0.00	0.0		0.0	0.000
46	MAJON VALLEY	876	0.39	1.60	72.0		16.1	0.008
47	SMITH VALLEY	474	0.09	1.60	72.0		12.4	0.002
49	HATHORNE	1971	3.58	1.60	72.0		22.2	0.071
50	MINA	1387	2.32	2.05	70.6		24.0	0.016
51	SCHURZ	401	0.49	1.60	72.0		20.5	0.010
53	BEATTY	4526	171.00	2.21	70.1		38.6	3.766
54	GARRS	1569	1.24	4.98	61.7		27.8	0.025
55	PAHRUMP	292	2.88	1.60	72.0		29.6	0.017
56	ROUND MNTAIN	730	0.48	5.97	58.7		28.4	0.010
57	TONOPAH	10183	242.00	3.62	65.4		40.1	4.810
59	LAKE	5984	2.03	1.60	72.0		15.0	0.040
60	VIRGINIA	219	0.00	0.00	0.0		0.0	0.000
61	GERLACH	4343	3.23	1.57	70.4		18.1	0.064
62	BEND	766	0.25	1.60	72.0		14.8	0.005
63	SPARKS	621	0.30	1.60	72.0		16.5	0.006
64	VERDI	73	0.00	0.00	0.0		0.0	0.000
65	WADSWORTH	730	0.25	1.60	72.0		15.0	0.005
67	BAKER	1168	0.21	1.60	72.0		12.2	0.004
68	FLY	7190	0.74	1.60	72.0		9.8	0.015
69	LUND	694	0.00	0.00	0.0		0.0	0.000
TOTAL		109889	5031.08					100.000

Table D-3b

1971 SR71 AIRCRAFT ONLY

09 JAN 78

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	1.72	0.80	3650.0	27.4	0.314
02	NEW RIVER	5036	22.28	0.80	3650.0	37.1	4.068
03	BUNKERVILLE	109	0.00	0.00	0.0	0.0	0.000
04	GOODSPRINGS	1095	22.20	0.80	3650.0	38.5	4.054
05	HENDERSON	219	1.25	0.80	3650.0	26.0	0.228
06	LAS VEGAS	1642	3.20	0.80	3650.0	30.1	0.584
07	LOGAN	73	0.00	0.00	0.0	0.0	0.000
08	MESQUITE	219	0.00	0.00	0.0	0.0	0.000
09	MOAPA	1533	1.04	0.80	3650.0	25.2	0.180
10	NELSON	730	7.86	0.80	3650.0	34.0	1.435
11	N LAS VEGAS	511	0.24	0.80	3650.0	18.9	0.044
12	OVERTON	1131	0.00	0.00	0.0	0.0	0.000
13	SEARCHLIGHT	803	11.69	0.80	3650.0	35.7	2.135
15	EAST FORK	730	4.96	0.80	3650.0	32.0	0.706
16	TAHOE	36	0.43	0.80	3650.0	21.4	0.029
18	CARLIN	1606	5.57	0.80	3650.0	32.5	1.012
19	EAST LINE	1533	15.96	0.80	3650.0	37.1	2.914
20	ELKO	3467	13.45	0.80	3650.0	36.3	2.456
21	JACKPOT	1168	4.30	0.80	3650.0	31.4	0.735
22	JARRIDGE	365	1.20	0.80	3650.0	25.9	0.219
23	MOUNTAIN CITY	3066	10.68	0.80	3650.0	35.3	1.750
24	TECOMA	2043	8.56	0.80	3650.0	34.4	1.534
25	WELLS	4161	25.26	0.80	3650.0	38.5	4.813
27	ESMERALDA	3503	27.12	0.80	3650.0	39.4	4.752
28	REDWAVE	1387	3.80	0.80	3650.0	30.9	0.694
29	EUREKA	2773	8.04	0.80	3650.0	34.1	1.458
31	GOLD RUN	1424	2.68	0.80	3650.0	29.3	0.489
32	McDERMITT	1533	3.68	0.80	3650.0	30.7	0.647
33	PARADISE VALY	1387	3.04	0.80	3650.0	29.9	0.536
34	UNION	5621	14.94	0.80	3650.0	34.9	2.718
36	ARGENTA	2519	5.78	0.80	3650.0	32.7	1.055
37	AUSTIN	3138	11.91	0.80	3650.0	35.8	2.115
39	ALAMO	3941	3.33	0.80	3650.0	30.0	0.506
40	CALIENTE	3066	0.71	0.80	3650.0	23.6	0.130
41	PANACA	621	0.17	0.80	3650.0	17.4	0.031
42	PIOCHE	2737	0.75	0.80	3650.0	23.8	0.132
44	CANAL	182	2.15	0.80	3650.0	28.4	0.493
45	DAYTON	438	5.16	0.80	3650.0	32.2	0.742
46	MASON VALLEY	876	5.12	0.80	3650.0	32.2	0.735
47	SMITH VALLEY	474	3.25	0.80	3650.0	30.2	0.523
49	HATHORNE	1971	4.00	0.80	3650.0	31.1	0.720
50	MINA	1387	2.78	0.80	3650.0	29.5	0.508
51	SCHURZ	401	1.01	0.80	3650.0	25.1	0.184
53	BEATTY	4526	17.49	0.80	3650.0	36.6	3.124
54	GABBS	1569	2.61	0.80	3650.0	29.2	0.471
55	FAHRUMP	292	1.12	0.80	3650.0	25.6	0.205
56	ROUND MNTAIN	730	1.12	0.80	3650.0	25.6	0.205
57	TONOPAH	10183	12.25	0.80	3650.0	31.5	2.232
59	LAKE	5984	84.03	0.80	3650.0	42.2	17.344
60	VIRGINIA	219	2.58	0.80	3650.0	29.2	0.471
61	GERLACH	4343	94.35	0.80	3650.0	44.1	17.229
62	RENO	766	16.13	0.80	3650.0	37.1	2.945
63	SPARKS	621	15.83	0.80	3650.0	37.1	2.891
64	VERDI	73	0.86	0.80	3650.0	24.4	0.152
65	WADSWORTH	730	15.70	0.80	3650.0	37.0	2.862
67	BAKER	1168	0.53	0.80	3650.0	22.3	0.092
68	ELY	7190	11.35	0.80	3650.0	32.7	2.023
69	LUND	694	0.41	0.80	3650.0	21.2	0.025
TOTAL		109889	547.63				100.000

Table D-3c

1971 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1-230K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Per cent of Total Events
01	CARSON CITY	146	1.72	0.80	0.0	27.4	0.031
02	NEW RIVER	5036	22.28	0.80	0.0	37.1	0.399
03	BONNEVILLE	109	0.03	1.60	0.0	14.2	0.001
04	GOODSPRINGS	1095	26.70	0.93	0.0	38.8	0.479
05	HENDERSON	219	2.47	1.20	0.0	29.7	0.044
06	LAS VEGAS	1642	87.20	1.53	0.0	37.6	1.563
07	LUGAN	73	0.02	1.60	0.0	14.2	0.000
08	MESQUITE	219	0.06	1.60	0.0	14.2	0.001
09	MURRAY	1533	572.04	1.56	0.0	45.4	10.254
10	NELSON	730	12.20	1.10	0.0	34.9	0.219
11	N LAS VEGAS	511	4.64	1.56	0.0	29.4	0.083
12	OVERTON	1131	0.31	1.60	0.0	14.2	0.006
13	SEARIGHT	803	17.88	1.09	0.0	36.5	0.321
15	EAST FORK	730	5.10	0.82	0.0	32.1	0.091
16	TAHOE	36	0.43	0.80	0.0	21.4	0.008
18	CARLIN	1606	6.19	0.88	0.0	32.6	0.111
19	EAST LINE	1533	15.96	0.80	0.0	37.1	0.286
20	BLND	3467	13.97	0.83	0.0	36.4	0.250
21	JACKPOT	1168	5.31	0.95	0.0	31.6	0.095
22	JARRIDGE	465	1.30	0.86	0.0	26.1	0.023
23	MOUNTAIN CITY	3066	12.12	0.90	0.0	35.4	0.217
24	TECUMA	2043	10.68	0.96	0.0	34.5	0.191
25	WELLS	4161	26.33	0.83	0.0	38.5	0.472
26	EMERALDA	3503	32.69	1.02	0.0	39.5	0.586
28	REDWAVE	1387	3.80	0.80	0.0	30.9	0.068
29	LORENA	2773	8.04	0.80	0.0	34.1	0.144
31	GOLD RUN	1424	3.07	0.90	0.0	29.5	0.055
32	McDERMITT	1533	3.74	0.85	0.0	30.8	0.071
33	PARADISE VALY	1387	3.42	0.89	0.0	30.0	0.061
34	UNION	5621	15.57	0.83	0.0	34.9	0.279
35	ARGENTA	2519	6.06	0.84	0.0	32.7	0.109
36	ARCTIC	3138	11.91	0.80	0.0	35.8	0.213
37	ALAMO	3941	1216.33	2.04	0.0	47.4	21.803
40	CALIENTE	3066	2451.71	1.80	0.0	50.2	43.948
41	BARACA	621	136.17	1.79	0.0	44.5	2.441
42	PIECHE	2737	89.75	1.58	0.0	36.4	1.609
44	CANAL	182	2.15	0.80	0.0	28.4	0.039
45	DAYTON	438	5.16	0.80	0.0	32.2	0.092
46	HASUN VALLEY	876	5.51	0.84	0.0	32.3	0.099
47	SMITH VALLEY	474	3.34	0.82	0.0	30.3	0.060
49	HATHORNE	1971	7.58	1.18	0.0	31.6	0.136
50	MINA	1387	5.10	1.37	0.0	30.6	0.091
51	SCHURZ	401	1.50	1.06	0.0	26.4	0.027
53	BEATTY	4526	208.49	1.23	0.0	40.7	3.737
54	GARBS	1569	3.85	2.15	0.0	41.6	0.069
55	POHUMP	292	4.00	1.38	0.0	31.0	0.077
56	ROUND MNTAIN	730	1.60	2.35	0.0	30.7	0.079
57	TUNDRAH	10193	254.25	1.40	0.0	40.7	4.558
59	LAKE	5984	86.06	0.82	0.0	42.2	1.543
60	VIRGINIA	219	2.58	0.80	0.0	29.2	0.046
61	GERLACH	4343	97.58	0.83	0.0	44.1	1.749
62	RENO	766	16.38	0.81	0.0	37.2	0.294
63	SPARKS	621	16.13	0.81	0.0	37.1	0.189
64	VERDI	73	0.86	0.80	0.0	24.4	0.015
65	WADSWORTH	730	15.95	0.81	0.0	37.0	0.286
67	BAKER	1168	0.74	1.03	0.0	22.7	0.013
68	ELY	7190	12.09	0.85	0.0	32.7	0.217
69	LUND	694	0.41	0.80	0.0	21.2	0.007
TOTAL		109889	5578.71				100.000

Table D-4a

1972 TACTICAL AIRCRAFT ONLY

09 JAN 86

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA			
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	Percent of Total Events
01	CARSON CITY	146	0.04	1.60	72.0	0.001
02	NEW RIVER	5036	1.01	1.60	72.0	0.004
03	BUNKERVILLE	109	1.59	1.60	72.0	0.038
04	GOODSPRINGS	1095	16.20	1.60	72.0	0.532
05	HENDERSON	219	5.44	1.63	72.2	0.175
06	LAS VEGAS	1642	68.00	1.67	72.3	1.605
07	LOGAN	73	1.06	1.60	72.0	0.015
08	MESQUITE	219	3.18	1.60	72.0	0.075
09	MOAPA	1533	465.00	1.66	72.3	10.924
10	NELSON	730	13.51	1.60	72.1	0.317
11	N LAS VEGAS	511	19.48	1.66	72.2	0.460
12	OVERTON	1131	16.43	1.60	72.0	0.383
13	SEARCHLIGHT	803	15.79	1.61	72.1	0.373
15	EAST FORK	730	0.06	1.60	72.0	0.001
16	TAHOE	36	0.01	1.60	72.0	0.000
18	CARLIN	1606	1.01	1.60	72.0	0.011
19	EAST LINE	1533	10.08	1.60	72.0	0.152
20	ELKO	3467	2.29	1.60	72.0	0.014
21	JACKPOT	1168	0.27	1.60	72.0	0.006
22	JARBRIDGE	365	0.30	1.60	72.0	0.007
23	MOUNTAIN CITY	3066	2.52	1.60	72.0	0.008
24	TECOMA	2043	0.72	1.60	72.0	0.011
25	WELLS	4161	10.45	1.60	72.0	0.114
27	ESMERALDA	3503	1.10	1.60	72.0	0.016
28	BEOWAWE	1387	0.00	0.00	0.0	0.000
29	EUREKA	2773	1.72	1.60	72.0	0.041
31	GOLD RUN	1424	2.26	1.60	72.0	0.053
32	MCDERMITT	1533	3.28	1.60	72.0	0.077
33	PARADISE VALY	1387	4.56	1.60	72.0	0.108
34	UNION	5621	4.17	1.60	72.0	0.098
36	ARGENTA	2519	0.28	1.60	72.0	0.007
37	AUSTIN	3138	0.99	1.60	72.0	0.023
39	ALAMO	3941	988.00	2.01	73.8	23.517
40	CALIENTE	3066	1998.00	2.00	74.9	47.154
41	PANACA	621	111.00	2.06	75.3	2.820
42	PDOCHE	2737	73.00	2.06	75.3	1.713
44	CANAL	182	0.05	1.60	72.0	0.001
45	DAYTON	438	0.12	1.60	72.0	0.003
46	MASON VALLEY	876	0.09	1.60	72.0	0.002
47	SMITH VALLEY	474	0.04	1.60	72.0	0.001
49	HATHORNE	1971	0.02	1.60	72.0	0.000
50	MINA	1387	0.42	1.60	72.0	0.010
51	SCHURZ	401	0.04	1.60	72.0	0.001
53	BEATTY	4526	156.00	1.80	74.0	3.882
54	GABBS	1569	1.60	1.60	72.0	0.038
55	FAHRUMP	292	10.68	1.68	72.4	0.157
56	ROUND MNTAIN	730	0.80	1.60	72.0	0.019
57	TONOPAH	10183	197.00	2.92	77.8	4.649
59	LAKE	5984	6.05	1.60	72.0	0.143
60	VIRGINIA	219	0.06	1.60	72.0	0.001
61	GERLACH	4343	7.48	1.57	70.7	0.177
62	RENO	766	0.76	1.60	72.0	0.018
63	SPARKS	621	0.83	1.60	72.0	0.020
64	VERDI	73	0.02	1.60	72.0	0.000
65	WADSWORTH	730	0.75	1.60	72.0	0.018
67	BAKER	1168	0.21	1.60	72.0	0.005
68	ELY	7190	4.66	1.60	72.0	0.110
69	LUND	694	6.74	3.10	78.0	0.159
TOTAL		109889	4237.22			100.000

Table D-4b

1972 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude 20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	1.96	0.80	3650.0	28.0	0.081
02	NEW RIVER	5036	22.34	0.80	3650.0	37.2	3.177
03	BUNKERVILLE	109	0.39	0.80	3650.0	21.0	0.006
04	GOODSPRINGS	1095	17.70	0.80	3650.0	37.5	2.533
05	HENDERSON	219	1.76	0.80	3650.0	27.5	0.252
06	LAS VEGAS	1642	5.05	0.80	3650.0	32.1	0.723
07	LUGAN	73	0.26	0.80	3650.0	19.2	0.037
08	MESQUITE	219	0.78	0.80	3650.0	24.0	0.112
09	MUOFA	1533	4.42	0.80	3650.0	31.5	0.633
10	NELSON	730	10.70	0.80	3650.0	35.4	1.531
11	N LAS VEGAS	511	1.58	0.80	3650.0	27.0	0.226
12	OVERTON	1131	4.03	0.80	3650.0	31.1	0.577
13	SEARCHLIGHT	803	14.68	0.80	3650.0	36.7	2.101
15	EAST FORK	730	9.66	0.80	3650.0	34.9	1.332
16	TAHOE	36	0.49	0.80	3650.0	22.0	0.010
18	CARLIN	1606	5.59	0.80	3650.0	32.5	0.300
19	EAST LINE	1533	10.50	0.80	3650.0	35.3	1.503
20	ELKO	3467	13.53	0.80	3650.0	36.4	1.936
21	JACKPOT	1168	5.07	0.80	3650.0	32.1	0.726
22	JARRIDGE	365	1.80	0.80	3650.0	27.6	0.258
23	MOUNTAIN CITY	3066	12.12	0.80	3650.0	35.9	1.735
24	TECOMA	2043	8.70	0.80	3650.0	34.5	1.245
25	WELLS	4161	20.63	0.80	3650.0	37.6	2.971
27	EMERALDA	3503	21.41	0.80	3650.0	38.4	3.064
28	BROWAWA	1387	4.56	0.80	3650.0	31.7	0.653
29	EUREKA	2773	5.56	0.80	3650.0	32.5	0.796
31	GOODYER	1424	21.23	0.80	3650.0	38.3	3.038
32	HEDESMITH	1533	18.30	0.80	3650.0	37.7	2.619
33	PARADISE VALY	1387	20.90	0.80	3650.0	38.3	2.991
34	UNION	5621	43.36	0.80	3650.0	39.6	6.205
36	ARGENTA	2519	20.04	0.80	3650.0	38.1	2.868
37	AUSTIN	3138	5.49	0.80	3650.0	32.5	0.786
39	ALAMO	3941	3.93	0.80	3650.0	30.7	0.567
40	CALLENTE	3066	9.46	0.80	3650.0	34.8	1.354
41	PANACA	621	1.87	0.80	3650.0	27.8	0.268
42	PICCHE	2737	3.13	0.80	3650.0	30.0	0.448
44	CANAL	182	2.45	0.80	3650.0	29.0	0.351
45	DAYTON	438	5.88	0.80	3650.0	32.8	0.842
46	MASON VALLEY	876	9.66	0.80	3650.0	34.9	1.332
47	SMITH VALLEY	474	6.28	0.80	3650.0	33.0	0.799
49	BATHURNE	1971	13.04	0.80	3650.0	36.2	1.866
50	MINA	1387	6.84	0.80	3650.0	33.4	0.779
51	SCHURZ	401	2.32	0.80	3650.0	28.7	0.330
53	BLATTY	4526	23.21	0.80	3650.0	37.8	3.320
54	GARBS	1569	7.34	0.80	3650.0	28.8	0.335
55	FAHRUMP	292	1.88	0.80	3650.0	27.8	0.269
56	ROUND MNTAIN	730	0.67	0.80	3650.0	23.3	0.096
57	TUNOFAH	10183	6.46	0.80	3650.0	28.7	0.775
59	LANE	5984	111.48	0.80	3650.0	43.4	15.954
60	VIRGINIA	219	2.94	0.80	3650.0	29.7	0.401
61	GERLACH	4343	85.17	0.80	3632.0	43.5	12.189
62	RENO	766	15.79	0.80	3650.0	37.0	2.269
63	SPARKS	621	14.93	0.80	3650.0	36.8	2.137
64	VERDI	73	0.98	0.80	3650.0	25.0	0.140
65	WADSWORTH	730	15.30	0.80	3650.0	36.9	2.190
67	BAKER	1168	2.43	0.80	3650.0	28.9	0.348
68	ELY	7190	15.61	0.80	3650.0	34.1	2.234
69	LUND	694	0.11	0.80	3650.0	15.5	0.016
TOTAL		109889	698.75				100.000

Table D-4c

1972 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA		SUPERSONIC EVENT DATA					Percent of Total Events:
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	2.00	0.82	0.0	28.2	0.041
02	NEW RIVER	5036	23.35	0.83	0.0	37.2	0.473
03	RUNKERVILLE	109	1.98	1.44	0.0	31.7	0.046
04	GOODSPRINGS	1095	33.90	1.18	0.0	38.5	0.587
05	HENDERSON	219	7.20	1.43	0.0	34.7	0.146
06	LAS VEGAS	1642	73.05	1.63	0.0	37.6	1.430
07	LOGAN	73	1.32	1.44	0.0	31.5	0.027
08	MESQUITE	219	3.96	1.44	0.0	32.0	0.030
09	MUAPA	1533	469.42	1.62	0.0	45.0	9.510
10	NELSON	730	24.21	1.25	0.0	37.1	0.490
11	N LAS VEGAS	511	21.06	1.59	0.0	36.3	0.477
12	OVERTON	1131	20.46	1.44	0.0	34.2	0.415
13	SEARCHLIGHT	803	30.47	1.22	0.0	38.2	0.617
15	EAST FORK	730	9.72	0.80	0.0	34.9	0.177
16	TAHOE	36	0.50	0.82	0.0	22.3	0.010
18	CARLIN	1606	6.60	0.92	0.0	32.7	0.134
19	EAST LINE	1533	20.58	1.19	0.0	36.0	0.417
20	ELKO	3467	15.82	0.92	0.0	36.4	0.321
21	JACKPOT	1168	5.34	0.84	0.0	32.2	0.108
22	JARRIDGE	365	2.10	0.91	0.0	28.2	0.043
23	MOUNTAIN CITY	3066	14.64	0.94	0.0	36.0	0.377
24	TUCOMA	2043	9.42	0.86	0.0	34.5	0.191
25	WELLS	4161	31.08	1.07	0.0	37.8	0.630
27	ESMERALDA	3503	22.51	0.84	0.0	38.4	0.455
28	BEOWAWE	1387	4.56	0.80	0.0	31.7	0.092
29	FOURKA	2773	7.28	0.99	0.0	32.6	0.147
31	GOLD RUN	1424	23.49	0.88	0.0	38.4	0.475
32	McDERMITT	1533	21.58	0.92	0.0	37.8	0.437
33	PARADISE VALY	1387	25.46	0.94	0.0	38.5	0.516
34	UNION	5621	47.53	0.87	0.0	39.6	0.963
36	ARGENTA	2519	20.32	0.81	0.0	38.1	0.412
37	AUSTIN	3138	6.48	0.92	0.0	32.5	0.131
39	ALAMO	3941	991.93	1.93	0.0	45.9	20.056
40	CALIENTE	3066	2007.46	1.84	0.0	50.0	40.670
41	PANACA	621	112.87	1.90	0.0	44.7	2.287
42	PIOCHE	2737	76.13	1.72	0.0	37.2	1.542
44	CANAL	182	2.50	0.82	0.0	29.1	0.051
45	DAYTON	438	6.00	0.82	0.0	32.8	0.122
46	MASON VALLEY	876	9.75	0.81	0.0	34.9	0.175
47	SMITH VALLEY	474	6.32	0.81	0.0	33.1	0.118
49	HATHORNE	1971	13.06	0.80	0.0	36.2	0.365
50	MINA	1387	7.26	0.85	0.0	33.5	0.147
51	SCHURZ	401	2.36	0.81	0.0	28.8	0.048
53	BEATTY	4526	179.21	1.34	0.0	40.1	3.531
54	GARRS	1569	3.94	1.12	0.0	29.3	0.080
55	FAHRUMP	292	12.56	1.55	0.0	36.4	0.354
56	ROUND MNTAIN	730	1.47	1.24	0.0	25.0	0.030
57	TONOPAH	10183	203.46	2.62	0.0	38.6	4.122
59	LAKE	5984	117.53	0.84	0.0	43.4	2.381
60	VIRGINIA	219	3.00	0.82	0.0	29.9	0.061
61	GERLACH	4343	92.65	0.86	0.0	43.6	1.877
62	RENO	766	16.55	0.84	0.0	37.1	0.435
63	SPARKS	621	15.76	0.84	0.0	36.9	0.419
64	VERDI	73	1.00	0.82	0.0	25.3	0.020
65	WADSWORTH	730	16.05	0.84	0.0	37.0	0.325
67	BAKER	1168	2.64	0.86	0.0	29.0	0.053
68	FLY	7190	20.27	0.98	0.0	34.2	0.411
69	LUND	694	6.85	3.06	0.0	35.6	0.139
TOTAL		109889	4935.97				100.000

Table D-5a

1973 TACTICAL AIRCRAFT ONLY

09- JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLIN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.00	0.00	0.0		0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0		0.0	0.000
03	BUNKERVILLE	109	0.00	0.00	0.0		0.0	0.000
04	GOODSPRINGS	1095	3.30	1.60	72.0		24.4	0.075
05	HENDERSON	219	0.88	2.11	74.0		28.2	0.020
06	LAS VEGAS	1642	73.00	2.24	74.6		39.2	1.673
07	LOGAN	73	0.00	0.00	0.0		0.0	0.000
08	MESQUITE	219	0.00	0.00	0.0		0.0	0.000
09	MOAPA	1533	497.00	2.24	74.6		47.8	11.392
10	NELSON	730	1.17	1.60	72.0		21.7	0.027
11	N LAS VEGAS	511	4.20	2.24	74.6		31.9	0.094
12	OPERTON	1131	0.00	0.00	0.0		0.0	0.000
13	SEARCHLIGHT	803	1.74	1.60	72.0		23.0	0.040
15	EAST FORK	730	0.00	0.00	0.0		0.0	0.000
16	TAROE	36	0.00	0.00	0.0		0.0	0.000
18	CARLIN	1606	0.00	0.00	0.0		0.0	0.000
19	EAST LINE	1533	0.00	0.00	0.0		0.0	0.000
20	ELKO	3467	0.00	0.00	0.0		0.0	0.000
21	JACKPOT	1168	0.00	0.00	0.0		0.0	0.000
22	JACKRIDGE	365	0.00	0.00	0.0		0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0		0.0	0.000
24	TECOMA	2043	0.00	0.00	0.0		0.0	0.000
25	WELLS	4161	0.00	0.00	0.0		0.0	0.000
27	ESMERALDA	3503	0.66	3.10	78.0		18.5	0.015
28	BROWNE	1387	0.00	0.00	0.0		0.0	0.000
29	LOPES	2773	0.00	0.00	0.0		0.0	0.000
31	GOLD RUN	1424	0.68	1.60	72.0		16.4	0.016
32	MCDERMOTT	1533	1.04	1.60	72.0		18.0	0.014
33	PARADISE VALY	1387	1.52	1.60	72.0		20.1	0.015
34	UNION	5621	0.78	1.60	72.0		11.1	0.018
36	ARGENTIA	2519	0.00	0.00	0.0		0.0	0.000
37	AUSTIN	3138	0.00	0.00	0.0		0.0	0.000
39	ALAMO	3941	1055.00	2.81	76.8		49.1	24.182
40	CALIENTE	3066	2135.00	2.93	77.5		53.7	48.738
41	PANACA	621	118.00	2.93	77.5		48.0	2.705
42	PIECHE	2737	78.00	2.93	77.5		39.8	1.788
44	CANAL	182	0.00	0.00	0.0		0.0	0.000
45	DAYTON	438	0.00	0.00	0.0		0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0		0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0		0.0	0.000
48	HATHORNE	1971	0.00	0.00	0.0		0.0	0.000
50	MINA	1387	0.24	3.10	78.0		18.1	0.006
51	SCHURZ	401	0.00	0.00	0.0		0.0	0.000
53	BEATTY	4526	167.00	2.36	75.0		38.9	3.828
54	GARBS	1569	0.00	0.00	0.0		0.0	0.000
57	FAHRUMP	292	2.84	2.23	74.5		32.6	0.005
58	ROUND MOUNTAIN	730	0.00	0.00	0.0		0.0	0.000
57	TONOPAH	10183	210.00	3.10	78.0		38.9	4.814
59	LAKE	5984	0.64	1.60	72.0		9.9	0.014
60	VIRGINIA	219	0.00	0.00	0.0		0.0	0.000
61	GERLACH	4343	1.02	1.60	72.0		13.4	0.013
62	RENO	766	0.10	1.60	72.0		10.8	0.002
63	SPARKS	621	0.12	1.60	72.0		12.5	0.003
64	VERDI	73	0.00	0.00	0.0		0.0	0.000
65	WADSWORTH	730	0.10	1.60	72.0		11.0	0.002
67	BAKER	1168	0.21	1.60	72.0		12.2	0.005
68	FLY	7190	0.74	1.60	72.0		9.8	0.017
69	LUND	694	7.68	3.10	78.0		36.2	0.176
TOTAL		109889	4362.66					100.000

Table D-5b

1973 SR71 AIRCRAFT ONLY

09 JAN 84

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLIN (dB)	Percent of Total Events
01	CARSON CITY	146	0.68	0.80	3650.0	23.4	0.076
02	NEW RIVER	5036	5.60	0.80	3650.0	31.1	2.449
03	BUNKERVILLE	109	0.06	0.80	3650.0	12.8	0.006
04	GOODSPRINGS	1095	5.70	0.80	3650.0	32.6	2.443
05	HENDERSON	219	0.52	0.80	3650.0	22.2	0.177
06	LAS VEGAS	1642	2.53	0.80	3650.0	29.1	1.102
07	LOGAN	73	0.04	0.80	3650.0	11.1	0.001
08	MESQUITE	219	0.12	0.80	3650.0	15.9	0.057
09	MOAPA	1533	1.62	0.80	3650.0	27.2	0.206
10	NELSON	730	3.31	0.80	3650.0	30.3	1.442
11	N LAS VEGAS	511	0.46	0.80	3650.0	31.7	0.209
12	OVERTON	1131	0.62	0.80	3650.0	23.0	0.270
13	SEARCHLIGHT	803	4.69	0.80	3650.0	31.8	2.045
15	EAST FORK	730	4.80	0.80	3650.0	31.9	2.041
16	TAHUE	36	0.17	0.80	3650.0	17.4	0.004
18	CARLIN	1606	1.37	0.80	3650.0	26.4	0.507
19	EAST LINE	1533	2.10	0.80	3650.0	28.3	0.415
20	ELKO	3467	2.24	0.80	3650.0	28.6	0.276
21	JACKPOT	1168	3.35	0.80	3650.0	30.3	1.430
22	HARRIDGE	365	0.40	0.80	3650.0	31.1	0.129
23	MOUNTAIN CITY	3066	3.36	0.80	3650.0	30.3	1.203
24	YEDOMA	2043	7.04	0.80	3650.0	33.5	3.047
25	WILLS	4161	5.87	0.80	3650.0	32.2	2.207
27	ESMERALDA	3503	6.72	0.80	3650.0	33.3	2.707
28	REDWAVE	1387	0.38	0.80	3650.0	30.2	0.097
29	FOKINA	2773	0.89	0.80	3650.0	24.2	0.203
31	ROLD RUN	1424	6.38	0.80	3650.0	34.1	2.707
32	McDERMITT	1533	7.32	0.80	3650.0	33.7	3.007
33	PARADISE VALY	1387	8.36	0.80	3650.0	34.3	3.207
34	UNION	5621	15.67	0.80	3650.0	35.1	3.307
36	ARGENTA	2519	3.77	0.80	3650.0	30.8	1.203
37	AUSTIN	3138	0.33	0.80	3650.0	30.2	0.043
39	ALAMO	3941	0.70	0.80	3650.0	23.2	0.097
40	CALIENTE	3066	7.10	0.80	3650.0	33.6	3.007
41	PANACA	621	1.70	0.80	3650.0	27.4	0.207
42	PLOCHE	2737	2.38	0.80	3650.0	28.9	1.007
44	CANAL	182	0.85	0.80	3650.0	24.4	0.207
45	DAYTON	438	2.04	0.80	3650.0	28.2	0.207
46	MASON VALLEY	876	4.55	0.80	3650.0	31.6	1.207
47	SMITH VALLEY	474	3.11	0.80	3650.0	30.0	1.207
49	HATHORNE	1971	5.96	0.80	3650.0	30.8	1.207
50	MINA	1387	3.08	0.80	3650.0	29.9	1.207
51	SCHURZ	401	0.93	0.80	3650.0	24.7	0.207
53	BEATTY	4526	3.02	0.80	3650.0	33.2	2.207
54	GABBS	1569	0.76	0.80	3650.0	26.9	0.207
55	FAHRUMP	292	0.72	0.80	3650.0	23.6	0.207
56	ROUND MNTAIN	730	0.17	0.80	3650.0	17.4	0.004
57	TONOPAH	10183	2.66	0.80	3650.0	24.9	1.207
59	LAKE	5984	30.38	0.80	3650.0	31.7	1.207
60	VIRGINIA	219	1.02	0.80	3650.0	25.1	0.207
61	GERLACH	4343	27.37	0.80	3631.3	30.6	1.207
62	RENO	766	5.27	0.80	3650.0	32.3	1.207
63	SPARKS	621	4.93	0.80	3650.0	32.0	1.207
64	VERDI	73	0.34	0.80	3650.0	20.4	0.043
65	WADSWORTH	730	5.10	0.80	3650.0	32.1	1.207
67	BAKER	1168	0.43	0.80	3650.0	17.4	0.004
68	ELY	7190	3.44	0.80	3650.0	27.5	1.207
69	LUND	694	0.06	0.80	3650.0	12.8	0.006
TOTAL		109889	229.53				100.00

Table D-5c

1973 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.68	0.80	0.0		23.4	0.015
02	NEW RIVER	5036	5.60	0.80	0.0		31.1	0.122
03	BUNKERVILLE	109	0.06	0.80	0.0		13.1	0.001
04	GOODSPRINGS	1095	9.00	1.09	0.0		33.2	0.196
05	HENDERSON	219	1.40	1.62	0.0		29.2	0.030
06	LAS VEGAS	1642	75.53	2.13	0.0		39.6	1.645
07	LOGAN	73	0.04	0.80	0.0		11.4	0.001
08	MESQUITE	219	0.12	0.80	0.0		16.0	0.003
09	MOAPA	1533	498.62	2.12	0.0		47.9	10.858
10	NELSON	730	4.48	1.01	0.0		30.8	0.098
11	N LAS VEGAS	511	4.66	2.10	0.0		32.3	0.101
12	OVERTON	1131	0.62	0.80	0.0		23.0	0.014
13	SEARCHLIGHT	803	6.43	1.02	0.0		32.3	0.140
15	EAST FORK	730	4.80	0.80	0.0		31.9	0.105
16	TAHOE	36	0.17	0.80	0.0		17.4	0.004
18	CARLIN	1606	1.37	0.80	0.0		26.4	0.030
19	EAST LINE	1533	2.10	0.80	0.0		28.3	0.046
20	ELKO	3467	2.24	0.80	0.0		28.6	0.049
21	JACKPOT	1168	3.35	0.80	0.0		30.3	0.073
22	JARRIDGE	365	0.40	0.80	0.0		21.1	0.009
23	MOUNTAIN CITY	3066	3.36	0.80	0.0		30.3	0.073
24	TECUMA	2043	7.04	0.80	0.0		33.5	0.153
25	WELLS	4161	5.87	0.80	0.0		32.2	0.128
27	ESMERALDA	3503	7.38	1.01	0.0		33.5	0.161
28	REOWAME	1387	0.38	0.80	0.0		20.9	0.008
29	EUREKA	2773	0.88	0.80	0.0		24.5	0.019
31	GOLD RUN	1424	7.06	0.88	0.0		33.2	0.154
32	MCDERMOTT	1533	8.36	0.90	0.0		33.8	0.182
33	PARADISE VALY	1387	9.88	0.92	0.0		34.4	0.215
34	UNION	5621	16.45	0.84	0.0		35.2	0.358
36	ARGENTA	2519	3.77	0.80	0.0		30.8	0.082
37	AUSTIN	3138	0.33	0.80	0.0		20.3	0.007
39	ALAMO	3941	1055.70	2.76	0.0		49.1	22.989
40	CALIENTE	3066	2142.10	2.70	0.0		53.7	46.847
41	PANACA	621	119.70	2.71	0.0		48.1	2.607
42	FLOCHE	2737	80.38	2.51	0.0		40.1	1.750
44	CANAL	182	0.85	0.80	0.0		24.4	0.019
45	DAYTON	438	2.04	0.80	0.0		28.2	0.044
46	MASON VALLEY	876	4.55	0.80	0.0		31.6	0.099
47	SMITH VALLEY	474	3.11	0.80	0.0		30.0	0.068
49	HATHURNE	1971	5.96	0.80	0.0		32.8	0.130
50	MINA	1387	3.32	0.97	0.0		30.2	0.072
51	SCHURZ	401	0.93	0.80	0.0		24.8	0.020
53	BEATTY	4526	175.02	1.46	0.0		39.9	3.811
54	GARBS	1569	0.76	0.80	0.0		23.9	0.017
55	FAHRUMP	292	3.56	1.94	0.0		33.1	0.078
56	ROUND MNTAIN	730	0.17	0.80	0.0		17.4	0.004
57	TONOPAH	10183	212.66	2.95	0.0		59.1	4.831
59	LANE	5984	31.02	0.82	0.0		37.7	0.675
60	VIRGINIA	219	1.02	0.80	0.0		25.2	0.022
61	GERLACH	4343	28.39	0.82	0.0		38.6	0.618
62	RENO	766	5.37	0.81	0.0		32.3	0.117
63	SPARKS	621	5.05	0.82	0.0		32.0	0.110
64	VERDI	73	0.34	0.80	0.0		20.4	0.007
65	WADSWORTH	730	5.20	0.82	0.0		32.2	0.113
67	BAKER	1168	0.64	1.06	0.0		21.9	0.014
68	ELY	7190	4.18	0.94	0.0		27.6	0.091
69	LUND	694	7.74	3.08	0.0		36.2	0.169
TOTAL		109889	4592.19					100.000

Table D-6a

1974 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLIN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.00	0.00	0.0		0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0		0.0	0.000
03	BUNKERVILLE	109	0.06	1.60	72.0		17.1	0.001
04	GOODSPRINGS	1095	1.80	1.68	73.3		22.3	0.038
05	HENDERSON	219	0.28	1.64	72.6		20.9	0.006
06	LAS VEGAS	1642	80.00	1.64	72.6		36.8	1.677
07	LOGAN	73	0.04	1.60	72.0		17.0	0.001
08	MESQUITE	219	0.12	1.60	72.0		17.0	0.003
09	MOAPA	1533	546.00	1.63	72.5		45.4	11.447
10	NELSON	730	0.52	1.63	72.5		18.4	0.011
11	N LAS VEGAS	511	1.00	1.63	72.5		22.8	0.021
12	OVERTON	1131	0.62	1.60	72.0		17.0	0.013
13	SEARCHLIGHT	803	0.64	1.64	72.6		18.9	0.013
15	EAST FORK	730	0.00	0.00	0.0		0.0	0.000
16	TAHOE	36	0.00	0.00	0.0		0.0	0.000
18	CARLIN	1606	0.00	0.00	0.0		0.0	0.000
19	EAST LINE	1533	0.00	0.00	0.0		0.0	0.000
20	ELKO	3467	0.00	0.00	0.0		0.0	0.000
21	JACKPOT	1168	0.00	0.00	0.0		0.0	0.000
22	JARBRIDGE	365	0.00	0.00	0.0		0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0		0.0	0.000
24	TECOMA	2043	0.00	0.00	0.0		0.0	0.000
25	WELLS	4161	0.00	0.00	0.0		0.0	0.000
27	ESMERALDA	3503	0.03	1.60	72.0		0.0	0.001
28	BEGWAVE	1387	0.00	0.00	0.0		0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0		0.0	0.000
31	GOLD RUN	1424	0.00	0.00	0.0		0.0	0.000
32	MCDERMITT	1533	0.00	0.00	0.0		0.0	0.000
33	PARADISE VALY	1387	0.00	0.00	0.0		0.0	0.000
34	UNION	5621	0.00	0.00	0.0		0.0	0.000
36	ARGENTA	2519	0.00	0.00	0.0		0.0	0.000
37	AUSTIN	3138	0.00	0.00	0.0		0.0	0.000
39	ALAMO	3941	1160.00	2.09	79.8		47.1	24.321
40	CALIENTE	3066	2347.00	2.09	79.9		51.3	49.207
41	PANACA	621	130.00	2.09	79.9		45.7	2.726
42	PICCHE	2737	85.00	2.09	79.9		37.4	1.782
44	CANAL	182	0.00	0.00	0.0		0.0	0.000
45	DAYTON	438	0.00	0.00	0.0		0.0	0.000
46	MASON VALLEY	876	0.04	1.60	72.0		6.3	0.001
47	SMITH VALLEY	474	0.00	0.00	0.0		0.0	0.000
49	HATHORNE	1971	0.51	1.60	72.0		13.8	0.011
50	MINA	1387	0.24	1.60	72.0		12.0	0.005
51	SCHURZ	401	0.07	1.60	72.0		12.1	0.001
53	BEATTY	4526	183.00	2.12	78.9		38.5	3.837
54	GABBS	1569	0.04	1.60	72.0		3.7	0.001
55	PAHRUMP	292	0.60	1.73	72.9		23.5	0.013
56	ROUND MNTAIN	730	0.00	0.00	0.0		0.0	0.000
57	TONOPAH	10183	232.00	2.10	80.0		36.1	4.864
59	LAKE	5984	0.00	0.00	0.0		0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0		0.0	0.000
61	GERLACH	4343	0.00	0.00	0.0		0.0	0.000
62	RENO	766	0.00	0.00	0.0		0.0	0.000
63	SPARKS	621	0.00	0.00	0.0		0.0	0.000
64	VERDI	73	0.00	0.00	0.0		0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0		0.0	0.000
67	BAKER	1168	0.00	0.00	0.0		0.0	0.000
68	ELY	7190	0.00	0.00	0.0		0.0	0.000
69	LUND	694	0.00	0.00	0.0		0.0	0.000
TOTAL		109889	4769.61					100.000

Table D-6b

1974 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLUN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	1.36	0.80	3650.0		26.4	0.278
02	NEW RIVER	5036	16.83	0.80	3650.0		35.9	3.442
03	BUNKERVILLE	109	0.21	0.80	3650.0		18.3	0.043
04	GOODSPRINGS	1095	17.40	0.80	3650.0		37.5	3.559
05	HENDERSON	219	1.17	0.80	3650.0		25.7	0.239
06	LAS VEGAS	1642	4.60	0.80	3650.0		31.7	0.941
07	LOGAN	73	0.14	0.80	3650.0		16.5	0.029
08	MESQUITE	219	0.42	0.80	3650.0		21.3	0.086
09	MOAPA	1533	3.20	0.80	3650.0		30.1	0.654
10	NELSON	730	5.69	0.80	3650.0		32.6	1.164
11	N LAS VEGAS	511	1.04	0.80	3650.0		25.2	0.213
12	OVERTON	1131	2.17	0.80	3650.0		28.4	0.444
13	SEARCHLIGHT	803	8.00	0.80	3650.0		34.1	1.636
15	EAST FORK	730	5.68	0.80	3650.0		32.6	1.162
16	TAHOE	36	0.34	0.80	3650.0		20.4	0.070
18	CARLIN	1606	2.62	0.80	3650.0		29.2	0.536
19	EAST LINE	1533	1.26	0.80	3650.0		26.1	0.258
20	EIKO	3467	7.66	0.80	3650.0		33.9	1.567
21	JACKPOT	1168	3.30	0.80	3650.0		30.2	0.675
22	JARBRIDGE	365	0.60	0.80	3650.0		22.8	0.123
23	MOUNTAIN CITY	3066	5.04	0.80	3650.0		32.1	1.031
24	TECOMA	2043	6.45	0.80	3650.0		33.2	1.319
25	WELLS	4161	8.24	0.80	3650.0		33.7	1.685
27	EMERALDA	3503	10.71	0.80	3650.0		38.2	4.236
28	REDWAVE	1387	1.52	0.80	3650.0		26.9	0.311
29	PIRENA	2773	3.24	0.80	3650.0		30.2	0.663
31	GOLD RUN	1424	12.81	0.80	3650.0		36.1	2.620
32	MCDERMITT	1533	15.18	0.80	3650.0		36.9	3.105
33	PARADISE VALY	1387	16.34	0.80	3650.0		37.2	3.342
34	UNION	5621	38.13	0.80	3650.0		39.0	7.778
36	ARGENTA	2519	8.64	0.80	3650.0		34.4	1.767
37	AUSTIN	3138	5.23	0.80	3650.0		32.2	1.070
39	ALAMO	3941	1.17	0.80	3650.0		25.4	0.239
40	CALIENTE	3066	11.93	0.80	3650.0		35.8	2.440
41	PANACA	621	2.72	0.80	3650.0		29.4	0.556
42	PIOCHE	2737	1.76	0.80	3650.0		27.5	0.360
44	CANAL	182	1.70	0.80	3650.0		27.4	0.348
45	DAYTON	438	4.08	0.80	3650.0		31.2	0.834
46	MASON VALLEY	876	5.47	0.80	3650.0		32.4	1.117
47	SMITH VALLEY	474	3.70	0.80	3650.0		30.7	0.757
48	HATHORNE	1971	3.54	0.80	3650.0		30.6	0.774
50	MINA	1387	2.58	0.80	3650.0		29.2	0.528
51	SCHURZ	401	0.86	0.80	3650.0		24.4	0.176
53	BEATTY	4526	17.10	0.80	3650.0		36.5	3.497
54	GARRS	1569	2.40	0.80	3650.0		28.9	0.491
55	PAHRUMP	292	1.28	0.80	3650.0		26.1	0.157
56	ROUND MNTAIN	730	1.09	0.80	3650.0		25.4	0.223
57	TUNOPAH	10183	12.07	0.80	3650.0		31.4	2.469
59	LANE	5984	77.74	0.80	3650.0		41.8	15.897
60	VIRGINIA	219	2.04	0.80	3650.0		28.2	0.417
61	GERLACH	4343	61.88	0.79	3621.1		42.1	12.655
62	RENO	766	11.04	0.80	3650.0		35.5	2.258
63	SPARKS	621	10.46	0.80	3650.0		35.3	2.139
64	VERDI	73	0.68	0.80	3650.0		23.4	0.139
65	WADSWORTH	730	10.70	0.80	3650.0		35.4	2.188
67	BAKER	1168	1.47	0.80	3650.0		26.7	0.301
68	ELY	7190	13.94	0.80	3650.0		33.6	2.851
69	ELUND	694	0.34	0.80	3650.0		20.4	0.070
TOTAL		109889	488.96					100.000

Table D-6c

1974 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1->30k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	1.36	0.80	0.0	26.4	0.026
02	NEW RIVER	5036	16.83	0.80	0.0	35.9	0.320
03	BUNKERVILLE	109	0.27	0.98	0.0	20.7	0.005
04	GOODSPRINGS	1095	19.20	0.88	0.0	37.6	0.365
05	HENDERSON	219	1.45	0.96	0.0	27.0	0.028
06	LAS VEGAS	1642	84.60	1.28	0.0	37.9	1.609
07	LOGAN	73	0.18	0.98	0.0	19.8	0.003
08	MESQUITE	219	0.54	0.98	0.0	22.7	0.010
09	MOAPA	1533	549.20	1.26	0.0	45.5	10.444
10	NELSON	730	6.21	0.87	0.0	32.8	0.118
11	N LAS VEGAS	511	2.04	1.21	0.0	27.2	0.039
12	OVERTON	1131	2.79	0.98	0.0	28.7	0.053
13	SEARCHLIGHT	803	8.64	0.86	0.0	34.2	0.164
15	EAST FORK	730	5.68	0.80	0.0	32.6	0.108
16	TAHOE	36	0.34	0.80	0.0	20.4	0.006
18	CARLIN	1606	2.62	0.80	0.0	29.2	0.050
19	EAST LINE	1533	1.26	0.80	0.0	26.1	0.024
20	ELKO	3467	7.66	0.80	0.0	33.9	0.146
21	JACKPOT	1168	3.30	0.80	0.0	30.3	0.063
22	JARRIDGE	365	0.60	0.80	0.0	22.9	0.011
23	MOUNTAIN CITY	3066	5.04	0.80	0.0	32.1	0.096
24	TECOMA	2043	6.45	0.80	0.0	33.2	0.123
25	WELLS	4161	8.24	0.80	0.0	33.7	0.157
27	ESMERALDA	3503	20.74	0.80	0.0	38.2	0.394
28	BEOWAWE	1387	1.52	0.80	0.0	26.9	0.029
29	EUREKA	2773	3.24	0.80	0.0	30.2	0.062
31	GOLD RUN	1424	12.81	0.80	0.0	36.1	0.144
32	McDERMITT	1533	15.18	0.80	0.0	36.9	0.289
33	PARADISE VALY	1387	16.34	0.80	0.0	37.2	0.311
34	UNION	5621	38.13	0.80	0.0	39.0	0.725
36	ARGENTA	2519	8.64	0.80	0.0	34.4	0.164
37	AUSTIN	3138	5.23	0.80	0.0	32.2	0.099
39	ALAMO	3941	1161.17	2.07	0.0	47.1	12.081
40	CALIENTE	3066	2358.93	2.00	0.0	51.4	44.859
41	PANACA	621	132.72	2.01	0.0	45.8	2.524
42	PIOCHE	2737	86.76	2.01	0.0	37.8	1.650
44	CANAL	182	1.70	0.80	0.0	27.4	0.032
45	DAYTON	438	4.08	0.80	0.0	31.2	0.078
46	MASON VALLEY	876	5.51	0.81	0.0	32.5	0.105
47	SMITH VALLEY	474	3.70	0.80	0.0	30.7	0.079
49	HATHORNE	1971	4.05	0.90	0.0	30.6	0.077
50	MINA	1387	2.82	0.87	0.0	29.3	0.054
51	SCHURZ	401	0.93	0.86	0.0	24.7	0.018
53	BEATTY	4526	200.10	1.16	0.0	40.6	3.005
54	GARBS	1569	2.44	0.81	0.0	28.9	0.048
55	FAHRUMP	292	1.88	1.10	0.0	28.0	0.036
56	ROUND MNTAIN	730	1.09	0.80	0.0	25.4	0.021
57	TONOPAH	10183	244.07	1.09	0.0	37.3	4.641
59	LAKE	5984	77.74	0.80	0.0	41.8	1.478
60	VIRGINIA	219	2.04	0.80	0.0	28.2	0.039
61	GERLACH	4343	61.88	0.79	0.0	42.1	1.177
62	RENO	766	11.04	0.80	0.0	35.5	0.210
63	SPARKS	621	10.46	0.80	0.0	35.3	0.199
64	VERDI	73	0.68	0.80	0.0	23.4	0.013
65	WADSWORTH	730	10.70	0.80	0.0	35.4	0.203
67	BAKER	1168	1.47	0.80	0.0	26.7	0.028
68	ELY	7190	13.94	0.80	0.0	33.6	0.165
69	LUND	694	0.34	0.80	0.0	20.4	0.005
TOTAL		109889	5258.57				100.000

Table D-7a

1975 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events:
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	LARSON CITY	146	0.12	1.60	72.0		18.8	0.003
02	NEW RIVER	5036	0.36	1.60	72.0		8.2	0.008
03	RUNKERVILLE	109	4.71	3.05	76.1		41.9	0.103
04	GOODSFRIES	1095	1.50	1.70	73.6		21.6	0.033
05	HENDERSON	219	5.30	2.92	75.8		39.0	0.116
06	LAS VEGAS	1642	75.00	1.96	73.5		38.1	1.645
07	LUGAN	73	3.14	3.05	76.1		41.7	0.069
08	MESQUITE	219	9.42	3.05	76.1		41.8	0.207
09	MUAPA	1533	510.00	2.68	75.2		49.6	11.185
10	NELSON	730	8.60	2.93	75.8		35.8	0.189
11	N LAS VEGAS	511	15.50	2.84	75.6		39.7	0.340
12	OVERTON	1131	48.67	3.05	76.1		41.8	1.067
13	SEARCHLIGHT	803	1.10	1.62	72.4		21.2	0.024
15	EAST FORK	730	0.18	1.60	72.0		13.6	0.004
16	TAHOE	36	0.03	1.60	72.0		15.9	0.001
18	CARLIN	1606	0.00	0.00	0.0		0.0	0.000
19	EAST LINE	1533	0.00	0.00	0.0		0.0	0.000
20	ELKO	3467	0.00	0.00	0.0		0.0	0.000
21	JACKPOT	1168	0.00	0.00	0.0		0.0	0.000
22	JARRIDGE	365	0.00	0.00	0.0		0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0		0.0	0.000
24	TEHOMA	2043	0.00	0.00	0.0		0.0	0.000
25	WELLS	4161	0.00	0.00	0.0		0.0	0.000
27	ESMERALDA	3503	0.00	0.00	0.0		0.0	0.000
28	BEOWAWE	1387	0.00	0.00	0.0		0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0		0.0	0.000
31	GOLD RUN	1424	0.00	0.00	0.0		0.0	0.000
32	McDERMITT	1533	0.00	0.00	0.0		0.0	0.000
33	PARADISE VALY	1387	0.00	0.00	0.0		0.0	0.000
34	UNION	5621	0.07	1.60	72.0		0.6	0.002
36	ARGENTA	2519	0.00	0.00	0.0		0.0	0.000
37	AUSTIN	3138	0.00	0.00	0.0		0.0	0.000
39	ALAMO	3941	1083.00	2.65	78.5		48.8	23.752
40	CALLENTE	3066	2193.00	2.37	79.1		52.0	48.097
41	PANACA	621	121.00	2.35	79.2		46.3	2.654
42	PLOCHE	2737	80.00	2.35	79.2		38.1	1.755
44	CANAL	182	0.15	1.60	72.0		18.8	0.003
45	DAYTON	438	0.36	1.60	72.0		18.8	0.008
46	MAYON VALLEY	876	0.18	1.60	72.0		12.8	0.004
47	SMITH VALLEY	474	0.12	1.60	72.0		13.7	0.003
49	HATHORNE	1971	0.00	0.00	0.0		0.0	0.000
50	MINA	1387	0.00	0.00	0.0		0.0	0.000
51	SCHURZ	401	0.00	0.00	0.0		0.0	0.000
53	BEATTY	4526	171.00	2.90	75.5		40.8	3.750
54	GARBS	1569	0.00	0.00	0.0		0.0	0.000
55	FAHRUMP	292	2.36	1.93	73.6		30.4	0.052
56	ROUND MNTAIN	730	0.00	0.00	0.0		0.0	0.000
57	TUNOFAH	10183	215.00	3.17	75.1		39.0	4.715
59	LAKE	5984	2.24	1.60	72.0		15.4	0.049
60	VIRGINIA	219	0.18	1.60	72.0		18.8	0.004
61	GERLACH	4343	3.57	1.60	72.0		18.8	0.008
62	KEND	766	0.83	1.60	72.0		20.0	0.018
63	SPARKS	621	0.75	1.60	72.0		20.5	0.016
64	VERDI	73	0.06	1.60	72.0		18.8	0.001
65	WADSWORTH	730	0.80	1.60	72.0		20.1	0.018
67	BAKER	1168	0.32	2.10	80.0		16.9	0.007
68	FLY	7190	0.93	2.10	80.0		13.6	0.020
69	LUND	694	0.01	2.10	80.0		4.1	0.000
TOTAL		109889	4559.56					100.000

Table D-7b

1975 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events:
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.60	0.91	3356.5	23.9		0.090
02	NEW RIVER	5036	58.59	1.08	2994.2	43.1		8.776
03	BUNKERVILLE	109	0.45	0.80	3650.0	21.6		0.067
04	GOODSPRINGS	1095	4.50	0.85	3503.3	32.2		0.674
05	HENDERSON	219	0.88	0.81	3622.7	24.6		0.132
06	LAS VEGAS	1642	0.73	0.82	3589.7	23.9		0.109
07	LOGAN	73	0.30	0.80	3650.0	19.8		0.045
08	MESQUITE	219	0.90	0.80	3650.0	24.6		0.135
09	MOAPA	1533	2.66	0.80	3650.0	29.3		0.398
10	NELSON	730	4.44	0.81	3629.7	31.7		0.665
11	N LAS VEGAS	511	1.26	0.80	3650.0	26.1		0.189
12	OVERTON	1131	4.65	0.80	3650.0	31.7		0.697
13	SEARCHLIGHT	803	5.34	0.82	3623.0	32.5		0.800
15	EAST FORK	730	1.74	0.86	3498.2	28.0		0.261
16	TAHOE	36	0.15	0.91	3356.5	17.9		0.022
18	CARLIN	1606	2.02	0.96	3244.9	29.7		0.303
19	EAST LINE	1533	6.30	0.80	3650.0	33.1		0.944
20	ELKO	3467	7.69	0.83	3613.6	34.2		1.192
21	JACKPOT	1168	4.67	0.84	3541.6	32.2		0.700
22	JACKBRIDGE	365	1.10	0.80	3650.0	25.5		0.185
23	MOUNTAIN CITY	3066	4.44	0.80	3650.0	31.5		0.665
24	TECOMA	2043	8.93	0.85	3519.4	35.1		1.338
25	WELLS	4161	13.83	0.82	3612.0	36.1		2.072
27	ESMERALDA	3503	14.03	0.85	3564.0	37.1		2.102
28	BEOWAWE	1387	3.42	1.19	2649.6	33.8		0.512
29	EUREKA	2773	7.32	0.85	3523.2	34.3		1.076
31	GOLD RUN	1424	17.13	1.02	3044.8	39.5		2.566
32	MCDERMITT	1533	11.66	0.96	3225.5	37.3		1.747
33	PARADISE VALY	1387	10.26	0.89	3405.4	36.1		1.537
34	UNION	5621	43.28	1.10	2885.6	41.3		6.483
36	ARGENTA	2519	19.65	1.09	2863.4	40.7		2.943
37	AUSTIN	3138	17.08	0.92	3414.1	38.6		2.558
39	ALAMO	3941	14.24	0.82	3637.5	36.5		2.133
40	CALIENTE	3066	17.36	0.80	3649.9	37.5		2.600
41	PANACA	621	3.74	0.80	3650.0	30.8		0.560
42	PIOCHE	2737	6.90	0.80	3650.0	33.5		1.034
44	CANAL	182	0.75	0.91	3356.5	24.9		0.112
45	DAYTON	438	1.80	0.91	3356.5	28.7		0.270
46	MASON VALLEY	876	3.91	0.96	3273.9	30.6		0.586
47	SMITH VALLEY	474	1.14	0.86	3495.5	26.2		0.171
49	HATHORNE	1971	10.81	0.87	3548.8	36.2		1.619
50	MINA	1387	7.46	0.91	3467.1	34.9		1.117
51	SCHURZ	401	3.45	1.01	3180.8	32.5		0.517
53	BEATTY	4526	17.52	0.80	3649.3	36.6		2.634
54	GABBS	1569	9.62	0.94	3412.5	36.3		1.441
55	FAHRUMP	292	0.76	0.80	3650.0	23.9		0.114
56	ROUND MNTAIN	730	4.43	0.94	3393.0	33.0		0.664
57	TUNOPAH	10183	38.84	0.87	3501.6	37.0		5.818
59	LAKE	5984	82.78	1.13	2832.9	44.0		12.400
60	VIRGINIA	219	0.90	0.91	3356.5	25.7		0.135
61	GERLACH	4343	66.81	1.19	2644.5	44.6		10.008
62	BEND	766	7.75	1.09	2971.8	36.6		1.161
63	SPARKS	621	8.07	1.12	2913.2	37.0		1.209
64	VERDI	73	0.30	0.91	3356.5	20.9		0.045
65	WADSWORTH	730	7.60	1.09	2964.3	36.6		1.138
67	BAKER	1168	13.16	0.83	3599.6	36.6		1.971
68	ELY	7190	54.83	0.83	3604.0	39.8		8.213
69	LUND	694	2.65	0.80	3648.5	29.3		0.327
TOTAL		109889	667.58					100.000

Table D-7c

1975 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events:
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	0.72	1.02	0.0	25.1	0.014
02	NEW RIVER	5036	58.95	1.08	0.0	43.1	1.128
03	BUNKERVILLE	109	5.16	2.85	0.0	41.9	0.099
04	GOODSPRINGS	1095	6.00	1.07	0.0	32.5	0.115
05	HENDERSON	219	6.18	2.62	0.0	39.1	0.118
06	LAS VEGAS	1642	75.73	1.92	0.0	38.3	1.449
07	LOGAN	73	3.44	2.85	0.0	41.7	0.066
08	MESQUITE	219	10.32	2.85	0.0	41.9	0.197
09	MOAPA	1533	512.66	2.56	0.0	49.6	9.808
10	NELSON	730	13.04	2.21	0.0	37.2	0.249
11	N LAS VEGAS	511	16.76	2.69	0.0	39.9	0.321
12	OVERTON	1131	53.32	2.85	0.0	42.2	1.020
13	SEARCHLIGHT	803	6.44	0.95	0.0	32.8	0.123
15	EAST FORK	730	1.92	0.93	0.0	28.2	0.037
16	TAHUE	36	0.18	1.02	0.0	20.0	0.003
18	CARLIN	1606	2.02	0.96	0.0	29.7	0.039
19	EAST LINE	1533	6.30	0.80	0.0	33.1	0.121
20	ELKO	3467	7.69	0.83	0.0	34.2	0.147
21	JACKFOT	1168	4.67	0.84	0.0	32.2	0.089
22	JARRIDGE	365	1.10	0.80	0.0	25.5	0.021
23	MOUNTAIN CITY	3066	4.44	0.80	0.0	31.5	0.085
24	TECOMA	2043	8.93	0.85	0.0	35.1	0.171
25	WELLS	4161	13.83	0.82	0.0	36.1	0.265
27	ESMERALDA	3503	14.03	0.85	0.0	37.1	0.268
28	REDWAVE	1387	3.42	1.19	0.0	33.8	0.065
29	EUREKA	2773	7.32	0.85	0.0	34.3	0.140
31	GOLD RUN	1424	17.13	1.02	0.0	39.5	0.328
32	MCDERMITT	1533	11.66	0.96	0.0	37.3	0.223
33	PARADISE VALY	1387	10.26	0.89	0.0	36.1	0.196
34	UNION	5621	43.35	1.10	0.0	41.3	0.829
36	ARGENTA	2519	19.65	1.09	0.0	40.7	0.376
37	AUSTIN	3138	17.08	0.92	0.0	38.6	0.327
39	ALAMO	3941	1097.24	2.60	0.0	49.0	20.991
40	CALLENTE	3066	2210.36	2.34	0.0	52.2	42.286
41	PANACA	621	124.74	2.32	0.0	46.4	2.386
42	RIOCHE	2737	86.90	2.27	0.0	39.4	1.662
44	CANAL	182	0.90	1.02	0.0	25.9	0.017
45	DAYTON	438	2.16	1.02	0.0	29.1	0.041
46	MASON VALLEY	876	4.09	0.99	0.0	32.6	0.078
47	SMITH VALLEY	474	1.26	0.93	0.0	26.5	0.024
47	HATHORNE	1971	10.81	0.87	0.0	36.2	0.207
50	MINA	1387	7.46	0.91	0.0	34.9	0.143
51	SCHURZ	401	3.45	1.01	0.0	32.5	0.066
53	HEATY	4526	188.52	2.39	0.0	42.2	3.607
54	GARBS	1569	9.62	0.94	0.0	36.3	0.184
55	FAHRUMP	292	3.12	1.65	0.0	31.3	0.060
56	ROUND MNTAIN	730	4.43	0.94	0.0	33.0	0.085
57	TUNOPAH	10183	253.84	1.92	0.0	41.1	4.856
59	LAKE	5984	85.02	1.14	0.0	44.0	1.627
60	VIRGINIA	219	1.08	1.02	0.0	26.5	0.021
61	GERLACH	4343	70.38	1.21	0.0	44.6	1.346
62	RENU	766	8.58	1.14	0.0	36.7	0.164
63	SPARKS	621	8.82	1.16	0.0	37.1	0.169
64	VERDI	73	0.36	1.02	0.0	23.0	0.007
65	WADSWORTH	730	8.40	1.14	0.0	36.7	0.161
67	BAKER	1168	13.48	0.86	0.0	36.6	0.258
68	FLY	7190	55.76	0.85	0.0	39.8	1.067
69	LUNDI	694	2.66	0.81	0.0	29.3	0.051
TOTAL		109889	5227.14				100.000

Table D-8a

1976 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLUN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.00	0.00	0.0	0.0	0.000	
02	NEW RIVER	5036	0.89	2.10	80.0	14.9	0.013	
03	BUNKERVILLE	109	0.12	1.60	72.0	20.1	0.002	
04	GOODSPRINGS	1095	4.20	1.85	73.4	26.8	0.043	
05	HENDERSON	219	2.43	2.61	76.4	34.6	0.037	
06	LAS VEGAS	1642	111.00	2.80	77.2	43.1	1.669	
07	LOGAN	73	0.08	1.60	72.0	20.1	0.001	
08	MESQUITE	219	0.24	1.60	72.0	20.1	0.004	
09	MOAPA	1533	757.00	2.79	77.2	51.7	11.387	
10	NELSON	730	2.54	1.64	72.2	25.3	0.038	
11	N LAS VEGAS	511	12.38	2.77	77.1	38.6	0.186	
12	OVERTON	1131	1.24	1.60	72.0	20.1	0.019	
13	SEARCHLIGHT	803	3.42	1.65	72.3	26.2	0.051	
15	EAST FORK	730	0.00	0.00	0.0	0.0	0.000	
16	TAHOE	36	0.00	0.00	0.0	0.0	0.000	
18	CARLIN	1606	0.13	1.60	72.0	8.7	0.007	
19	EAST LINE	1533	1.26	1.60	72.0	18.8	0.019	
20	ELKO	3467	0.52	1.60	72.0	11.4	0.008	
21	JACKPOT	1168	0.00	0.00	0.0	0.0	0.000	
22	JARRIDGE	365	0.00	0.00	0.0	0.0	0.000	
23	MOUNTAIN CITY	3066	0.00	0.00	0.0	0.0	0.000	
24	TECOMA	2043	0.09	1.60	72.0	8.1	0.001	
25	WELLS	4161	1.46	1.60	72.0	15.1	0.027	
27	ESMERALDA	3503	0.85	2.79	78.3	18.7	0.013	
28	BEOWAWE	1387	0.38	1.60	72.0	14.0	0.006	
29	EUREKA	2773	0.12	1.60	72.0	6.0	0.002	
31	GOLD RUN	1424	0.66	1.60	72.0	18.3	0.010	
32	McDERMITT	1533	0.00	0.00	0.0	0.0	0.000	
33	PARADISE VALY	1387	0.00	0.00	0.0	0.0	0.000	
34	UNION	5621	0.54	1.60	72.0	9.5	0.003	
36	ARGENTA	2519	1.25	1.60	72.0	16.6	0.019	
37	AUSTIN	3138	0.00	0.00	0.0	0.0	0.000	
39	ALAMO	3941	1608.00	2.30	79.5	49.4	24.176	
40	CALIENTE	3066	3253.00	2.31	79.6	53.5	48.909	
41	PANACA	621	180.00	2.31	79.6	47.9	2.706	
42	PIOCHE	2737	118.00	2.31	79.6	39.6	1.774	
44	CANAL	182	0.00	0.00	0.0	0.0	0.000	
45	DAYTON	438	0.00	0.00	0.0	0.0	0.000	
46	MASON VALLEY	876	0.07	1.81	75.4	10.0	0.001	
47	SMITH VALLEY	474	0.00	0.00	0.0	0.0	0.000	
49	HATHORNE	1971	0.53	1.62	72.3	14.1	0.008	
50	MINA	1387	0.34	1.75	74.4	14.5	0.005	
51	SCHURZ	401	0.11	1.78	74.9	15.1	0.007	
53	BEATTY	4526	254.00	2.43	78.3	41.1	3.817	
54	GABBS	1569	0.04	1.60	72.0	3.7	0.001	
55	FAHRUMP	292	8.76	2.73	77.0	39.4	0.132	
56	ROUND MNTAIN	730	0.00	0.00	0.0	0.0	0.000	
57	TONOPAH	10183	321.00	2.46	78.7	38.8	4.326	
59	LAKE	5984	3.96	1.60	72.0	17.9	0.020	
60	VIRGINIA	219	0.00	0.00	0.0	0.0	0.000	
61	GERLACH	4343	0.00	0.00	0.0	0.0	0.000	
62	RENO	766	0.00	0.00	0.0	0.0	0.000	
63	SPARKS	621	0.00	0.00	0.0	0.0	0.000	
64	VERDI	73	0.00	0.00	0.0	0.0	0.000	
65	WADSWORTH	730	0.00	0.00	0.0	0.0	0.000	
67	BAKER	1168	0.00	0.00	0.0	0.0	0.000	
68	ELY	7190	0.48	1.60	72.0	7.9	0.007	
69	LUND	694	0.00	0.00	0.0	0.0	0.000	
TOTAL		109889	6651.09				100.000	

Table D-8b

1976 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude 200K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.56	1.48	1866.4	27.9	0.096
02	NEW RIVER	5036	50.16	1.11	2893.7	42.5	8.637
03	BUNKERVILLE	109	0.78	0.80	3650.0	24.0	0.134
04	GOODSPRINGS	1095	6.30	0.88	3440.4	33.8	1.085
05	HENDERSON	219	1.25	0.84	3551.1	26.5	0.215
06	LAS VEGAS	1642	3.00	0.81	3620.7	29.9	0.517
07	LOGAN	73	0.52	0.80	3650.0	22.2	0.090
08	MESQUITE	219	1.56	0.80	3650.0	27.0	0.269
09	MOHA	1533	5.72	0.80	3650.0	32.6	0.985
10	NELSON	730	4.33	0.92	3398.8	32.7	0.746
11	N LAS VEGAS	511	2.44	0.80	3650.0	28.9	0.420
12	ORTON	1131	8.06	0.80	3650.0	34.1	1.388
13	SEARCHLIGHT	803	4.45	0.97	3296.4	33.2	0.766
15	EAST FORK	730	1.40	1.40	2119.7	31.4	0.241
16	TAHOE	36	0.14	1.48	1866.4	21.9	0.024
18	CARLIN	1606	3.93	0.96	3299.7	32.6	0.677
19	EAST LINE	1533	7.98	0.80	3650.0	34.1	1.374
20	ELKO	3467	13.32	0.92	3508.4	37.5	2.294
21	JACKPOT	1168	4.16	0.82	3602.4	31.4	0.716
22	JACKBRIDGE	365	1.30	0.86	3480.7	26.8	0.224
23	MOUNTAIN CITY	3066	7.92	0.88	3416.6	34.9	1.364
24	TEHOMA	2043	7.46	0.80	3650.0	33.8	1.285
25	WELLS	4161	18.06	0.85	3593.6	37.5	3.110
27	ESMERALDA	3503	8.33	1.02	3246.5	36.1	1.434
28	BEOWAWE	1387	3.42	1.13	2871.9	33.4	0.589
29	EUREKA	2773	8.58	0.86	3552.5	35.0	1.477
31	GOLD RUN	1424	9.42	1.09	2839.2	37.5	1.622
32	MCDERMITT	1533	10.04	1.12	2888.3	38.0	1.729
33	PARADISE VALLEY	1387	5.32	0.86	3492.8	32.9	0.916
34	UNION	5621	52.14	1.24	2606.2	42.7	8.978
36	ARGENTA	2519	12.65	1.16	2622.3	39.3	2.178
37	AUSTIN	3138	20.19	0.97	3315.8	39.8	3.476
39	ALAMO	3941	6.53	0.80	3648.5	32.9	1.124
40	CALIENTE	3066	10.76	0.80	3650.0	35.4	1.853
41	PANACA	621	1.70	0.80	3650.0	27.4	0.293
42	PIECHE	2737	7.50	0.80	3650.0	33.8	1.291
44	CANAL	182	0.70	1.48	1866.4	28.8	0.121
45	DAYTON	438	1.68	1.48	1866.4	32.6	0.289
46	MASON VALLEY	876	2.98	1.24	2562.4	33.6	0.513
47	SMITH VALLEY	474	0.92	1.40	2114.2	29.6	0.158
49	HATHORNE	1971	6.49	1.09	3113.6	35.9	1.118
50	MINA	1387	5.08	1.09	3057.6	34.8	0.875
51	CHURCH	401	2.45	1.11	2940.3	31.8	0.422
53	BEATTY	4526	4.79	0.85	3618.3	31.4	0.825
54	GARBS	1569	7.98	1.08	3039.0	36.7	1.374
55	FAHRUMP	292	0.44	0.83	3631.8	21.8	0.076
56	ROUND MNTAIN	730	3.83	1.08	3039.3	33.5	0.659
57	TONOPAH	10183	33.95	0.94	3356.5	37.0	5.846
59	LAKE	5984	78.52	1.22	2553.3	44.0	13.520
60	VIRGINIA	219	0.84	1.48	1866.4	29.6	0.145
61	GERLACH	4343	57.80	1.27	2355.8	44.0	9.952
62	KENO	766	6.24	1.38	2194.4	37.8	1.074
63	SPARKS	621	6.34	1.36	2253.8	37.7	1.092
64	VERDI	73	0.28	1.48	1866.4	24.9	0.048
65	WADSWORTH	730	6.10	1.38	2201.9	37.6	1.050
67	BAKER	1168	7.61	0.80	3650.0	33.9	1.310
68	ILY	7190	33.04	0.81	3644.2	37.4	5.689
69	LUND	694	1.32	0.84	3625.8	26.7	0.227
TOTAL		109889	580.76				100.000

Table D-8c

1976 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLIN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.50	1.48	0.0	27.9	0.008	
02	NEW RIVER	5036	51.05	1.13	0.0	42.5	0.706	
03	BUNKERVILLE	109	0.90	0.91	0.0	25.5	0.012	
04	GOODSPRINGS	1095	10.50	1.27	0.0	34.6	0.145	
05	HENDERSON	219	3.68	2.01	0.0	35.2	0.051	
06	LAS VEGAS	1642	114.00	2.73	0.0	43.3	1.576	
07	LOGAN	73	0.60	0.91	0.0	24.3	0.008	
08	MESQUITE	219	1.80	0.91	0.0	27.8	0.025	
09	MOAPA	1533	762.72	2.59	0.0	51.8	10.547	
10	NELSON	730	6.87	1.19	0.0	33.4	0.095	
11	N LAS VEGAS	511	14.82	2.45	0.0	39.0	0.205	
12	OVERTON	1131	9.30	0.91	0.0	34.3	0.129	
13	SEARCHLIGHT	803	7.87	1.27	0.0	34.0	0.109	
15	EAST FORK	730	1.40	1.40	0.0	31.4	0.019	
16	TAHOE	36	0.14	1.48	0.0	21.9	0.002	
18	CARLIN	1606	4.06	0.98	0.0	32.6	0.056	
19	EAST LINE	1533	9.24	0.91	0.0	34.2	0.128	
20	ELKO	3467	13.84	0.95	0.0	37.5	0.191	
21	JACKPOT	1168	4.16	0.82	0.0	31.4	0.058	
22	JARBRIDGE	365	1.30	0.86	0.0	26.9	0.018	
23	MOUNTAIN CITY	3066	7.92	0.88	0.0	44.9	0.110	
24	TECOMA	2043	7.55	0.81	0.0	33.8	0.104	
25	WELLS	4161	19.52	0.91	0.0	37.6	0.270	
27	ESMERALDA	3503	9.18	1.19	0.0	36.2	0.127	
28	BEDWAVE	1387	3.80	1.18	0.0	33.5	0.053	
29	EUREKA	2773	8.70	0.87	0.0	35.0	0.120	
31	GOLD RUN	1424	10.08	1.13	0.0	37.6	0.139	
32	MCDERMITT	1533	10.04	1.12	0.0	38.0	0.139	
33	PARADISE VALY	1387	5.32	0.86	0.0	32.9	0.074	
34	UNION	5621	52.68	1.24	0.0	42.7	0.738	
36	ARGENTA	2519	13.90	1.20	0.0	39.4	0.192	
37	AUSTIN	3138	20.19	0.97	0.0	39.8	0.279	
39	ALAMO	3941	1614.53	2.29	0.0	49.5	22.325	
40	CALIENTE	3066	3263.76	2.30	0.0	53.6	45.130	
41	PANACA	621	181.70	2.31	0.0	47.9	2.512	
42	PIOCHE	2737	125.50	2.27	0.0	40.6	1.735	
44	CANAL	182	0.70	1.48	0.0	28.9	0.010	
45	DAYTON	438	1.68	1.48	0.0	32.7	0.023	
46	MASON VALLEY	876	3.05	1.25	0.0	33.6	0.042	
47	SMITH VALLEY	474	0.92	1.40	0.0	29.6	0.013	
49	HATHORNE	1971	7.02	1.13	0.0	35.9	0.097	
50	MINA	1387	5.42	1.13	0.0	34.8	0.075	
51	SCHURZ	401	2.56	1.14	0.0	31.9	0.035	
53	BEATTY	4526	258.79	2.36	0.0	41.6	3.578	
54	GARBS	1569	8.02	1.08	0.0	36.7	0.111	
55	FAHRUMP	292	9.20	2.64	0.0	39.4	0.127	
56	ROUND MNTAIN	730	3.83	1.08	0.0	33.5	0.053	
57	TONOPAH	10183	354.95	1.91	0.0	41.0	4.908	
59	LAKE	5984	82.48	1.24	0.0	44.0	1.141	
60	VIRGINIA	219	0.84	1.48	0.0	29.6	0.012	
61	GERLACH	4343	57.80	1.27	0.0	44.0	0.799	
62	RENO	766	6.24	1.38	0.0	37.8	0.036	
63	SPARKS	621	6.34	1.36	0.0	37.7	0.088	
64	VERDI	73	0.28	1.48	0.0	24.9	0.004	
65	WADSWORTH	730	6.10	1.38	0.0	37.6	0.084	
67	BAKER	1168	7.61	0.80	0.0	33.9	0.105	
68	ELY	7190	33.52	0.82	0.0	37.4	0.464	
69	LUND	694	1.32	0.84	0.0	26.7	0.018	
TOTAL		109889	7231.85				100.000	

Table D-9a

1977 TACTICAL AIRCRAFT ONLY

C- JAN-86

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLIN (dB)	Percent of Total Events
01	CARSON CITY	146	0.00	0.00	0.0	0.0	0.000
02	NEW RIVER	5036	0.37	1.60	72.0	8.3	0.005
03	BUNKERVILLE	109	0.09	2.27	76.7	22.1	0.001
04	GOODSPRINGS	1095	0.60	1.60	72.0	17.0	0.007
05	HENDERSON	219	2.56	2.74	76.7	35.3	0.052
06	LAS VEGAS	1642	134.00	2.86	77.0	44.1	1.557
07	LOGAN	73	0.06	2.27	76.7	21.9	0.001
08	MESQUITE	219	0.18	2.27	76.7	22.1	0.002
09	MOAPA	1533	918.00	2.85	77.0	52.7	11.417
10	NELSON	730	2.25	1.67	72.7	25.0	0.028
11	N LAS VEGAS	511	13.92	2.85	77.0	39.3	0.173
12	OVERTON	1131	0.93	2.27	76.7	22.1	0.012
13	SEARCHLIGHT	803	2.99	1.63	72.5	25.5	0.032
15	EAST FORK	730	0.00	0.00	0.0	0.0	0.000
16	TAHUE	36	0.00	0.00	0.0	0.0	0.000
18	CARLIN	1606	0.12	1.60	72.0	8.4	0.001
19	EAST LINE	1533	0.00	0.00	0.0	0.0	0.000
20	ELKO	3467	1.50	1.60	72.0	16.0	0.019
21	JACKPOT	1168	0.00	0.00	0.0	0.0	0.000
22	HARRIBRIDGE	365	0.00	0.00	0.0	0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0	0.0	0.000
24	TERRELL	2043	0.00	0.00	0.0	0.0	0.000
25	WELLS	4161	0.96	1.60	72.0	13.3	0.011
27	EMERALDA	3503	0.47	1.60	72.0	10.9	0.008
28	BLOWAW	1387	0.00	0.00	0.0	0.0	0.000
29	FOURNA	2773	0.06	1.60	72.0	3.0	0.001
31	GOLD RUN	1424	0.00	0.00	0.0	0.0	0.000
32	McDERMOTT	1533	0.00	0.00	0.0	0.0	0.000
33	PARADISE VALY	1387	0.00	0.00	0.0	0.0	0.000
34	UNION	5621	0.00	0.00	0.0	0.0	0.000
36	ARGENTIA	2519	0.00	0.00	0.0	0.0	0.000
37	AUSTIN	3138	0.53	1.60	72.0	11.9	0.007
39	ALAMO	3941	1948.00	2.19	79.8	49.8	24.227
40	CALIENTE	3066	3944.00	2.38	79.4	54.6	49.051
41	PANACA	621	218.00	2.38	79.4	49.0	2.711
42	PLOCHE	2737	143.00	2.38	79.4	40.7	1.778
44	CANAL	182	0.00	0.00	0.0	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.0	0.000
46	MASON VALLEY	876	0.04	1.60	72.0	6.3	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.0	0.000
49	HATHORNE	1971	0.51	1.60	72.0	13.8	0.006
50	MINA	1387	0.40	1.60	72.0	14.3	0.005
51	SCHURZ	401	0.07	1.60	72.0	12.1	0.001
53	HEATY	4526	307.00	2.32	78.9	41.6	3.818
54	BARRS	1569	0.75	1.60	72.0	16.5	0.009
55	PAHRUMP	292	9.56	2.80	76.8	40.0	0.119
56	ROUND MNTAIN	730	0.36	1.60	72.0	16.6	0.004
57	TONOPAH	10183	389.00	2.33	78.9	39.1	4.338
59	LAKE	5984	0.00	0.00	0.0	0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0	0.0	0.000
61	GERLACH	4343	0.00	0.00	0.0	0.0	0.000
62	KENO	766	0.00	0.00	0.0	0.0	0.000
63	SPARKS	621	0.00	0.00	0.0	0.0	0.000
64	VERDI	73	0.00	0.00	0.0	0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0	0.0	0.000
67	BAKER	1168	0.00	0.00	0.0	0.0	0.000
68	ELY	7190	0.36	1.60	72.0	6.7	0.004
69	FUND	694	0.00	0.00	0.0	0.0	0.000
TOTAL		109889	8040.64				100.000

Table D-9b

1977 SR71 AIRCRAFT ONLY

09 JAN 86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.80	1.36	2261.4	28.7	0.110
02	NEW RIVER	5036	54.95	1.30	2371.4	43.4	8.273
03	BUNKERVILLE	109	1.08	0.80	3650.0	25.4	0.143
04	GOODSPRINGS	1095	5.70	1.04	3049.7	34.9	0.095
05	HENDERSON	219	1.46	0.83	3571.9	27.0	0.210
06	LAS VEGAS	1642	0.81	0.91	3368.4	25.3	0.142
07	LOGAN	73	0.72	0.80	3650.0	23.6	0.109
08	MESQUITE	219	2.16	0.80	3650.0	28.4	0.325
09	MOAPA	1533	6.02	0.80	3650.0	32.9	0.206
10	NELSON	730	4.53	0.83	3574.5	31.9	0.442
11	N LAS VEGAS	511	2.94	0.80	3650.0	29.7	0.443
12	OVERTON	1131	11.16	0.80	3650.0	35.5	1.840
13	SEARCHLIGHT	803	4.01	0.86	3507.8	31.7	0.604
15	EAST FORK	730	1.20	1.36	2261.4	30.5	0.131
16	TAHOE	36	0.20	1.36	2261.4	22.7	0.030
18	CARLIN	1606	5.14	1.03	3135.0	34.4	0.774
19	EAST LINE	1533	10.50	0.83	3562.0	35.6	1.581
20	ELKO	3467	18.11	0.91	3546.2	38.8	2.772
21	JACKPOT	1168	7.42	0.80	3647.6	33.8	1.111
22	JARRIDGE	365	1.60	0.82	3637.5	27.3	0.241
23	MOUNTAIN CITY	3066	10.44	0.96	3254.4	36.9	1.507
24	TECUMA	2043	14.53	0.90	3645.5	36.7	2.188
25	WELLS	4161	26.00	0.85	3589.0	39.1	3.014
27	ESMERALDA	3503	11.00	1.13	2950.1	37.7	1.626
28	BEOWAWE	1387	3.42	1.08	3094.2	33.0	0.315
29	EUREKA	2773	10.60	0.83	3598.7	35.6	1.586
31	GOLD RUN	1424	8.27	1.24	2515.2	38.0	1.345
32	McDERMITT	1533	8.38	1.38	2372.9	39.0	1.762
33	PARADISE VALY	1387	5.70	1.13	2852.4	35.6	0.808
34	UNION	5621	41.28	1.49	2111.9	42.4	6.115
36	ARGENTA	2519	10.97	1.22	2610.2	39.1	1.807
37	AUSTIN	3138	26.68	0.94	3391.7	40.7	4.017
39	ALAMO	3941	16.91	0.85	3616.6	37.5	2.547
40	CALIENTE	3066	18.50	0.80	3649.7	37.7	2.385
41	PANACA	621	3.23	0.80	3650.0	30.2	0.448
42	PIOCHE	2737	5.29	0.80	3650.0	32.3	0.727
44	CANAL	182	1.00	1.36	2261.4	29.7	0.131
45	DAYTON	438	2.40	1.36	2261.4	33.5	0.231
46	MASON VALLEY	876	2.54	1.39	2163.4	33.9	0.307
47	SMITH VALLEY	474	0.80	1.36	2261.4	33.7	0.130
49	HATHORNE	1971	1.86	1.25	2789.9	31.6	0.380
50	MINA	1387	2.68	1.29	2490.1	33.5	0.403
51	SCHURZ	401	1.82	1.41	2100.8	32.6	0.214
53	BEATTY	4526	3.25	0.95	3459.2	30.5	0.409
54	GABBS	1569	8.39	1.16	2768.8	32.5	1.263
55	PAHRUMP	292	0.08	0.95	3550.0	15.6	0.012
56	ROUND MNTAIN	730	4.23	1.16	2765.9	34.5	0.637
57	TONOPAH	10183	48.42	0.96	3301.7	38.6	2.270
59	LAKE	5984	83.80	1.33	2397.8	44.7	12.616
60	VIRGINIA	219	1.20	1.36	2261.4	30.5	0.131
61	GERLACH	4343	65.45	1.45	2025.4	45.1	9.054
62	RENO	766	8.15	1.43	2175.5	39.2	1.227
63	SPARKS	621	8.14	1.44	2158.2	39.3	1.225
64	VERDI	73	0.40	1.36	2261.4	25.7	0.070
65	WADSWORTH	730	7.95	1.43	2173.3	39.1	1.197
67	BAKER	1168	7.27	0.80	3650.0	33.7	1.095
68	ELY	7190	39.99	0.81	3636.8	33.3	6.011
69	LUND	694	2.69	0.85	3614.3	29.9	0.405
TOTAL		109889	664.22				100.000

Table D-9c

1977 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	BARNSON CITY	146	0.80	1.36	0.0	28.7	0.009
02	NEW RIVER	5036	55.32	1.31	0.0	43.4	0.536
03	WINNERVILLE	109	1.17	0.91	0.0	27.1	0.013
04	GOODSPRINGS	1095	6.30	1.10	0.0	35.0	0.072
05	HENDERSON	219	4.02	2.05	0.0	35.9	0.046
06	LAS VEGAS	1642	134.81	2.84	0.0	44.2	1.549
07	LUGAN	73	0.78	0.91	0.0	25.9	0.009
08	ME SQUITE	219	2.34	0.91	0.0	29.3	0.027
09	MUANA	1533	924.02	2.66	0.0	52.8	10.615
10	NELSON	730	6.78	1.11	0.0	32.7	0.078
11	N LAS VEGAS	511	16.86	2.49	0.0	39.8	0.194
12	OVERTON	1131	12.09	0.91	0.0	35.7	0.139
13	SEAFORTH	803	7.00	1.19	0.0	32.6	0.080
14	EAST FORK	730	1.20	1.36	0.0	30.5	0.014
15	FAHOL	36	0.20	1.36	0.0	22.7	0.002
16	FAHLLN	1606	5.26	1.05	0.0	34.4	0.060
17	EAST LINE	1533	10.50	0.83	0.0	35.6	0.121
18	ELKO	3467	19.61	0.97	0.0	38.8	0.225
21	BACKFOT	1168	7.42	0.80	0.0	33.8	0.085
22	BARBRIDGE	365	1.60	0.82	0.0	27.3	0.018
23	MOUNTAIN CITY	3066	10.44	0.96	0.0	36.9	0.120
24	FLUOMA	2043	14.53	0.80	0.0	36.7	0.167
25	WELLS	4161	26.96	0.88	0.0	39.2	0.310
27	EMERALDA	3503	11.47	1.15	0.0	37.7	0.132
28	REDWAVE	1387	3.42	1.08	0.0	33.0	0.039
29	LORENA	2773	10.66	0.83	0.0	35.6	0.122
31	BUILD RUN	1424	8.27	1.24	0.0	38.0	0.095
32	MCDERMITT	1533	8.38	1.38	0.0	39.0	0.096
33	PARADISE VALY	1387	5.70	1.13	0.0	35.6	0.065
34	UNION	5621	41.28	1.49	0.0	42.4	0.474
35	ARGENTA	2519	10.97	1.22	0.0	39.1	0.126
37	AUSTIN	3138	27.21	0.95	0.0	40.7	0.313
39	ALAMO	3941	1964.91	2.18	0.0	50.0	22.523
40	CALIENTE	3066	3962.50	2.37	0.0	54.7	45.521
41	PANOLA	621	221.23	2.37	0.0	49.0	2.541
42	FLUCHE	2737	148.29	2.36	0.0	41.3	1.704
44	LANAL	182	1.00	1.36	0.0	29.7	0.011
45	DAYTON	438	2.40	1.36	0.0	33.5	0.038
46	MAYN VALLEY	876	2.58	1.39	0.0	33.9	0.030
47	SMITH VALLEY	474	0.80	1.36	0.0	28.7	0.009
49	HAUDORNE	1971	2.37	1.33	0.0	31.7	0.027
50	MINA	1387	3.08	1.33	0.0	33.5	0.035
51	SCHURZ	401	1.89	1.42	0.0	32.6	0.022
53	BEATTY	4526	310.25	2.30	0.0	41.9	3.584
54	BEERS	1569	7.14	1.19	0.0	37.6	0.105
55	FAHRUMP	292	7.64	2.79	0.0	40.0	0.111
56	BURND MNTAIN	730	4.59	1.19	0.0	34.6	0.053
57	TONOPAH	10183	437.42	2.06	0.0	41.9	5.025
59	LAKE	5984	83.80	1.33	0.0	44.7	0.963
60	VIRGINIA	219	1.20	1.36	0.0	30.5	0.014
61	GERLACH	4343	65.45	1.45	0.0	45.1	0.752
62	RENO	766	8.15	1.43	0.0	39.2	0.094
63	SPARKS	621	8.14	1.44	0.0	39.3	0.094
64	VERDI	73	0.40	1.36	0.0	25.7	0.005
65	WADSWORTH	730	7.95	1.43	0.0	39.1	0.091
67	BANKER	1168	7.27	0.80	0.0	33.7	0.081
68	ULLY	7190	40.35	0.82	0.0	38.3	0.464
69	LUND	694	2.69	0.85	0.0	29.9	0.031
TOTAL		109889	8704.86				100.000

Table D-10a

1978 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30k ft , Mach Number >1.0

TOWNSHIP DATA		SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)
						Percent of Total Events
01	CARSON CITY	146	0.00	0.00	0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0	0.000
03	BUNKERVILLE	109	0.42	2.31	75.7	0.006
04	GOODSPRINGS	1095	1.80	1.60	72.0	0.005
05	HENDERSON	219	1.76	3.14	74.8	0.004
06	LAS VEGAS	1642	121.00	3.58	74.8	0.004
07	LUGAN	73	0.28	2.31	75.7	0.002
08	MESQUITE	219	0.84	2.31	75.7	0.002
09	MOAPA	1533	827.00	3.50	74.8	0.010
10	NELSON	730	1.60	1.91	73.6	0.004
11	N LAS VEGAS	511	8.44	3.41	74.9	0.003
12	OVERTON	1131	4.34	2.31	75.7	0.003
13	SEARCHLIGHT	803	1.32	1.60	72.0	0.002
15	EAST FORK	730	0.00	0.00	0.0	0.000
16	TAHOE	36	0.00	0.00	0.0	0.000
18	EARLIN	1506	0.00	0.00	0.0	0.000
19	EAST LINE	1533	2.10	2.90	78.4	0.001
20	ELKO	3467	0.00	0.00	0.0	0.000
21	JACKPOT	1168	0.00	0.00	0.0	0.000
22	JARRIDGE	365	0.00	0.00	0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0	0.000
24	THEOMA	2043	0.15	2.90	78.4	0.001
25	WELLS	4161	1.90	2.90	78.4	0.001
27	ESMERALDA	3503	0.22	4.90	56.0	0.001
28	BEOWAWE	1387	0.00	0.00	0.0	0.000
29	EUREKA	2773	1.56	1.60	72.0	0.001
31	GOLD RUN	1424	0.00	0.00	0.0	0.000
32	MCDERMITT	1533	0.16	1.60	72.0	0.001
33	PARADISE VALY	1387	0.00	0.00	0.0	0.000
34	UNION	5621	1.16	1.60	72.0	0.001
36	ARGENTA	2519	0.00	0.00	0.0	0.000
37	AUSTIN	3138	0.99	1.60	72.0	0.001
39	ALAMO	3941	1756.00	2.32	79.5	0.013
40	CALIENTE	3066	3554.00	2.33	79.0	0.011
41	PANACA	671	197.00	2.33	79.0	0.001
42	FLOCHE	2737	129.00	2.33	79.0	0.001
44	CANAL	182	0.00	0.00	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.000
49	HATHORNE	1971	0.00	0.00	0.0	0.000
50	MINA	1387	0.08	4.90	56.0	0.001
51	SCHURZ	401	0.00	0.00	0.0	0.000
53	BEATTY	4526	277.00	2.45	78.9	0.002
54	GARBS	1569	0.32	4.90	56.0	0.001
55	PAHRUMP	292	5.04	3.53	74.8	0.001
56	ROUND MNTAIN	730	0.16	4.90	56.0	0.001
57	TONOPAH	10183	350.00	2.31	79.4	0.001
59	LANE	5984	0.00	0.00	0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0	0.000
61	GERLACH	4343	0.68	1.44	64.6	0.001
62	RENO	766	0.00	0.00	0.0	0.000
63	SPARKS	621	0.00	0.00	0.0	0.000
64	VERDI	73	0.00	0.00	0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0	0.000
67	BAKER	1168	0.00	0.00	0.0	0.000
68	ELY	7190	0.60	2.90	78.4	0.001
69	LUND	694	0.00	0.00	0.0	0.000
TOTAL		109889	7246.92			100.000

Table D-10b

1978 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.40	1.12	2769.6	24.0	0.056
02	NEW RIVER	5036	39.51	1.28	2475.3	42.0	5.504
03	RUNKERVILLE	109	0.69	0.80	3650.0	23.5	0.036
04	GOODSPRINGS	1095	9.30	1.28	2417.2	38.8	1.296
05	HENDERSON	219	1.50	0.95	3307.2	28.3	0.209
06	LAS VEGAS	1642	2.77	0.95	3343.0	31.0	0.386
07	LOGAN	73	0.46	0.80	3650.0	21.7	0.064
08	MESQUITE	219	1.38	0.80	3650.0	26.5	0.192
09	MOAPA	1533	4.98	0.82	3639.6	32.2	0.694
10	NELSON	730	7.48	0.97	3288.1	35.5	1.042
11	N LAS VEGAS	511	2.14	0.81	3644.4	28.5	0.298
12	OVERTON	1131	7.13	0.80	3650.0	33.6	0.993
13	SEARCHLIGHT	803	9.20	1.01	3202.0	36.7	1.282
15	EAST FORK	730	0.60	1.12	2769.6	25.8	0.084
18	TAHOE	36	0.10	1.12	2769.6	18.0	0.014
19	CARLIN	1606	5.83	0.96	3360.7	34.3	0.812
19	EAST LINE	1533	16.38	0.78	3556.4	37.0	2.382
20	ELKO	3467	16.32	0.85	3605.6	37.7	2.273
21	JACKPOT	1168	8.11	0.81	3645.6	34.2	1.130
22	JARRIDGE	365	1.60	0.84	3625.0	27.5	0.223
23	MOUNTAIN CITY	3066	11.04	0.88	3597.8	36.3	1.539
24	YEDOMA	2043	16.54	0.80	3643.4	37.2	2.304
25	WELLS	4161	30.67	0.80	3597.6	39.3	4.272
27	ESMERALDA	3503	7.68	0.98	3256.1	35.4	1.070
28	BROWAWAY	1387	5.70	1.21	2596.2	36.2	0.794
29	EUREKA	2773	7.48	0.96	3246.1	35.4	1.042
31	GOLD RUN	1424	14.68	1.02	3065.3	38.8	2.945
32	MCDERMITT	1533	5.64	1.06	2982.8	35.0	0.786
33	PARADISE VALY	1387	3.80	0.96	3209.8	32.4	0.529
34	UNION	5621	30.25	1.13	2818.7	39.8	4.214
35	ARGENTA	2519	12.67	1.08	2924.2	41.2	3.158
37	AUSTIN	3138	14.37	0.95	3311.2	40.4	3.095
39	ALAMO	3941	44.13	0.86	3544.2	41.7	6.141
40	CALIENTE	3066	12.08	0.80	3645.7	35.9	1.683
41	PANACA	621	2.04	0.80	3650.0	28.2	0.284
42	FLUCHE	2737	10.92	0.85	3521.0	35.9	1.521
44	CANAL	182	0.50	1.12	2769.6	25.0	0.070
45	DAYTON	438	1.20	1.12	2769.6	28.8	0.182
46	MASON VALLEY	876	1.54	1.28	2429.3	31.0	0.218
47	SMITH VALLEY	474	0.40	1.12	2769.6	24.0	0.056
49	HATHORNE	1971	2.56	0.94	3298.0	30.6	0.357
50	MINA	1387	2.92	1.02	3144.1	31.8	0.402
51	SCHURZ	401	1.32	1.35	2284.7	30.8	0.184
53	BEATTY	4526	11.38	0.86	3436.6	39.5	4.371
54	GARBS	1569	7.19	0.96	3298.0	35.2	1.002
55	FAHRUMP	292	0.92	0.90	3219.6	25.7	0.128
56	KIRK MNTAIN	730	3.66	0.96	3304.5	32.2	0.510
57	TONUPAH	10183	83.17	0.86	3527.1	40.3	11.586
59	LAKE	5984	79.46	1.17	2691.9	43.9	11.669
60	VIRGINIA	219	0.60	1.12	2769.6	25.8	0.084
61	GERLACH	4343	34.85	1.28	2301.2	41.8	4.335
62	BEND	766	4.35	1.26	2445.4	35.4	0.606
63	SPARKS	621	4.40	1.29	2385.0	35.7	0.613
64	VERDI	73	0.20	1.12	2769.6	21.0	0.038
65	WADSWORTH	730	4.25	1.27	2437.8	35.3	0.792
67	HANER	1168	10.68	0.82	3584.1	35.6	1.438
68	ELY	7190	51.23	0.83	3563.1	39.4	7.136
69	LUND	694	5.51	0.81	3631.5	32.6	0.758
TOTAL		109889	717.86				100.000

Table D-10c

1978 ALL SUPERSONIC AIRCRAFT

09-JUN-86

Altitude .1->30k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLIN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.40	1.12	0.0	34.0	0.005	
02	NEW RIVER	5036	39.51	1.28	0.0	42.0	0.476	
03	RUNKERVILLE	109	1.11	1.37	0.0	30.0	0.014	
04	GOODSPRINGS	1095	11.10	1.33	0.0	38.9	0.137	
05	HENDERSON	219	3.26	2.13	0.0	35.6	0.041	
06	LAS VEGAS	1642	123.77	3.45	0.0	45.6	1.574	
07	LOGAN	73	0.74	1.37	0.0	29.5	0.007	
08	MESQUITE	219	2.22	1.37	0.0	30.9	0.013	
09	MOAPA	1533	831.98	3.15	0.0	54.0	10.446	
10	NELSON	730	9.08	1.14	0.0	35.8	0.114	
11	N LAS VEGAS	511	10.58	2.89	0.0	39.0	0.135	
12	OVERTON	1131	11.47	1.37	0.0	34.9	0.144	
13	SEARCHLIGHT	803	10.52	1.08	0.0	36.9	0.132	
15	EAST FORK	730	0.60	1.12	0.0	25.8	0.008	
16	TAHOE	36	0.10	1.12	0.0	18.1	0.001	
18	CARLIN	1606	5.83	0.96	0.0	34.3	0.023	
19	EAST LINE	1533	18.48	1.02	0.0	37.4	0.232	
20	ELKO	3467	16.32	0.85	0.0	37.7	0.205	
21	JACKPOT	1168	8.11	0.81	0.0	34.2	0.101	
22	JARRIDGE	365	1.60	0.84	0.0	27.5	0.020	
23	MOUNTAIN CITY	3066	11.04	0.88	0.0	36.3	0.117	
24	TECOMA	2043	16.69	0.82	0.0	37.3	0.210	
25	WELLS	4161	32.57	0.92	0.0	39.4	0.407	
27	ESMERALDA	3503	7.90	1.09	0.0	35.4	0.077	
28	REDWAVE	1387	5.70	1.21	0.0	36.2	0.072	
29	EUREKA	2773	9.04	1.07	0.0	35.4	0.113	
31	GOLD RUN	1424	14.68	1.02	0.0	38.8	0.184	
32	McDERMITT	1533	5.80	1.08	0.0	35.0	0.073	
33	PARADISE VALY	1387	3.80	0.96	0.0	32.4	0.048	
34	UNION	5621	31.41	1.14	0.0	39.8	0.374	
36	ARGENTA	2519	22.67	1.08	0.0	41.2	0.255	
37	AUSTIN	3138	25.36	0.97	0.0	40.4	0.318	
39	ALAMO	3941	1800.13	2.24	0.0	50.4	22.601	
40	CALIENTE	3066	3566.08	2.29	0.0	54.0	44.73	
41	PANACA	621	199.04	2.30	0.0	48.4	2.477	
42	PLOCHE	2737	139.92	2.13	0.0	41.5	1.757	
44	CANAL	182	0.50	1.12	0.0	25.0	0.006	
45	DAYTON	438	1.20	1.12	0.0	28.8	0.015	
46	MASON VALLEY	876	1.54	1.28	0.0	31.0	0.017	
47	SMITH VALLEY	474	0.40	1.12	0.0	24.0	0.005	
49	HATHORNE	1971	2.56	0.94	0.0	30.6	0.021	
50	MINA	1387	3.00	1.12	0.0	31.9	0.033	
51	SCHUKZ	401	1.32	1.35	0.0	30.8	0.017	
53	BEATTY	4526	308.38	1.92	0.0	43.7	3.372	
54	GABBS	1569	7.51	1.13	0.0	35.4	0.084	
55	FAHRUMP	292	5.96	3.13	0.0	39.3	0.075	
56	ROUND MNTAIN	730	3.82	1.12	0.0	32.6	0.043	
57	TONOPAH	10183	433.17	1.30	0.0	42.5	5.437	
59	LAKE	5984	79.46	1.17	0.0	43.9	0.273	
60	VIRGINIA	219	0.60	1.12	0.0	25.8	0.008	
61	GERLACH	4343	35.53	1.28	0.0	41.8	0.446	
62	RENO	766	4.35	1.26	0.0	35.4	0.055	
63	SPARKS	621	4.40	1.29	0.0	35.7	0.055	
64	VERDI	73	0.20	1.12	0.0	21.0	0.003	
65	WADSWORTH	730	4.25	1.27	0.0	35.3	0.053	
67	BAKER	1168	10.68	0.82	0.0	35.6	0.134	
68	ELY	7190	51.83	0.86	0.0	39.5	0.651	
69	LUND	694	5.51	0.81	0.0	32.6	0.067	
TOTAL		109889	7964.78				100.000	

Table D-11a

1979 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1-230K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	0.00	0.00	0.0	0.0	0.000
02	NEW RIVER	5036	0.89	1.60	72.0	12.1	0.012
03	BUNKERVILLE	109	0.18	1.85	73.0	23.2	0.002
04	GOODSPRINGS	1095	0.00	0.00	0.0	0.0	0.000
05	HENDERSON	219	0.46	2.26	75.6	26.1	0.006
06	LAS VEGAS	1642	125.00	2.53	77.2	42.7	1.673
07	LOGAN	73	0.12	1.85	73.0	23.1	0.002
08	MESQUITE	219	0.36	1.85	73.0	23.1	0.005
09	MOAPA	1533	856.00	2.45	76.7	51.1	11.457
10	NELSON	730	0.30	1.85	73.0	17.1	0.004
11	N LAS VEGAS	511	2.16	2.38	76.3	29.6	0.029
12	OVERTON	1131	1.86	1.85	73.0	23.1	0.025
13	SLACKCREEK	803	0.00	0.00	0.0	0.0	0.000
15	EAST FORK	730	0.00	0.00	0.0	0.0	0.000
16	TAHOE	36	0.00	0.00	0.0	0.0	0.000
18	CARLIN	1606	0.00	0.00	0.0	0.0	0.000
19	EAST LINE	1533	0.00	0.00	0.0	0.0	0.000
20	ELKO	3467	0.00	0.00	0.0	0.0	0.000
21	JACKPOT	1168	0.00	0.00	0.0	0.0	0.000
22	JACKBRIDGE	365	0.00	0.00	0.0	0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0	0.0	0.000
24	TEHOMA	2043	0.00	0.00	0.0	0.0	0.000
25	WELLS	4161	0.00	0.00	0.0	0.0	0.000
27	ESMERALDA	3503	1.80	3.80	61.3	23.6	0.024
28	BEOWAWE	1387	0.00	0.00	0.0	0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0	0.0	0.000
31	GOLD RUN	1424	0.00	0.00	0.0	0.0	0.000
32	MCDERMITT	1533	0.16	1.60	72.0	9.8	0.002
33	PARADISE VALY	1387	0.00	0.00	0.0	0.0	0.000
34	UNION	5621	0.84	1.60	72.0	11.4	0.011
36	ARGENTA	2519	0.00	0.00	0.0	0.0	0.000
37	AUSTIN	3138	0.00	0.00	0.0	0.0	0.000
39	ALAMO	3941	1817.00	2.32	79.4	50.0	24.319
40	VALLENTE	3066	3677.00	2.25	79.1	53.8	49.214
41	PANACA	621	203.00	2.25	79.1	48.2	2.717
42	FLUCHE	2737	134.00	2.25	79.1	39.9	1.793
44	CANAL	182	0.00	0.00	0.0	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.0	0.000
46	MASON VALLEY	876	0.03	1.60	72.0	5.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.0	0.000
49	HATHORNE	1971	0.02	1.60	72.0	0.0	0.000
50	MINA	1387	0.02	1.60	72.0	1.2	0.000
51	SCHURZ	401	0.04	1.60	72.0	9.6	0.001
53	BEATTY	4526	287.00	2.83	76.8	42.9	3.841
54	GARBS	1569	0.00	0.00	0.0	0.0	0.000
55	FAHRUMP	292	1.24	2.44	76.7	29.9	0.017
56	ROUND MNTAIN	730	0.00	0.00	0.0	0.0	0.000
57	TONOPAH	10183	362.00	2.91	76.6	40.6	4.845
59	LAKE	5984	0.00	0.00	0.0	0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0	0.0	0.000
61	GERLACH	4343	0.00	0.00	0.0	0.0	0.000
62	KENO	766	0.00	0.00	0.0	0.0	0.000
63	SPARKS	621	0.00	0.00	0.0	0.0	0.000
64	VERDI	73	0.00	0.00	0.0	0.0	0.000
65	WAUSWORTH	730	0.00	0.00	0.0	0.0	0.000
67	BAKER	1168	0.00	0.00	0.0	0.0	0.000
68	ELY	7190	0.00	0.00	0.0	0.0	0.000
69	LUND	694	0.00	0.00	0.0	0.0	0.000
TOTAL		109889	7471.48				100.000

Table D-11b

1979 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLIN (dB)	
01	CARSON CITY	146	0.12	1.43	2116.0	20.9	0.018
02	NEW RIVER	5036	29.78	1.04	3066.1	39.9	4.438
03	BUNKERVILLE	109	0.51	0.80	3650.0	22.1	0.026
04	GOODSPRINGS	1095	10.50	0.91	3428.2	36.4	1.585
05	HENDERSON	219	1.19	0.84	3581.4	26.2	0.177
06	LAS VEGAS	1642	0.70	0.91	3428.2	24.6	0.104
07	LOGAN	73	0.34	0.80	3650.0	20.4	0.051
08	MESQUITE	219	1.02	0.80	3650.0	25.1	0.152
09	MOAPA	1533	2.72	0.80	3650.0	29.4	0.405
10	NELSON	730	5.86	0.83	3602.1	33.1	0.873
11	N LAS VEGAS	511	1.36	0.80	3650.0	26.4	0.204
12	OVERTON	1131	5.27	0.80	3650.0	32.3	0.785
13	SEARCHLIGHT	803	7.36	0.84	3588.0	34.1	1.027
15	EAST FORK	730	0.18	1.43	2116.0	22.7	0.027
16	TAHOE	36	0.03	1.43	2116.0	14.9	0.004
18	CARLIN	1606	5.06	0.91	3490.3	33.2	0.754
19	EAST LINE	1533	15.12	0.85	3572.2	37.4	2.253
20	ELKO	3467	21.16	0.90	3548.7	39.4	3.154
21	JACKPOT	1168	3.71	0.83	3586.9	31.1	0.553
22	JARBRIDGE	365	0.80	0.98	3324.9	25.8	0.119
23	MOUNTAIN CITY	3066	5.52	0.86	3536.9	33.1	0.823
24	TECOMA	2043	7.97	0.81	3639.5	34.1	1.188
25	WELLS	4161	29.45	0.87	3569.6	39.8	4.389
27	ESMERALDA	3503	11.86	0.93	3503.4	37.1	1.758
28	BEOVAWE	1387	7.60	1.03	3249.9	36.0	1.133
29	EUREKA	2773	12.02	0.88	3552.5	36.7	1.791
31	GOLD RUN	1424	14.38	1.03	3066.6	38.9	2.143
32	MCDERMITT	1533	8.96	0.96	3377.1	36.2	1.435
33	PARADISE VALY	1387	6.08	0.93	3462.4	34.2	0.906
34	UNION	5621	45.66	1.09	3020.2	41.6	6.805
36	ARGENTA	2519	23.04	1.05	3072.3	41.0	3.434
37	AUSTIN	3138	19.99	0.89	3457.7	39.0	2.979
39	ALAMO	3941	22.06	0.83	3561.2	38.4	3.288
40	CALIENTE	3066	13.67	0.80	3648.4	36.4	2.037
41	FANACA	621	2.72	0.80	3650.0	29.4	0.405
42	PIOCHE	2737	6.24	0.88	3424.3	33.9	0.950
44	CANAL	182	0.15	1.43	2116.0	21.9	0.022
45	DAYTON	438	0.36	1.43	2116.0	25.7	0.054
46	MASON VALLEY	876	1.17	1.07	2996.7	28.3	0.174
47	SMITH VALLEY	474	0.12	1.43	2116.0	20.9	0.018
49	HATHORNE	1971	5.01	0.86	3565.7	32.7	0.747
50	MINA	1387	3.74	0.89	3453.1	31.8	0.557
51	SCHURZ	401	1.47	0.99	3204.9	28.6	0.219
53	BEATTY	4526	21.64	0.88	3593.2	38.2	3.225
54	GARBS	1569	6.55	0.93	3349.1	34.5	0.976
55	FAHRUMP	292	0.40	1.07	3470.0	23.6	0.060
56	ROUND MNTAIN	730	3.21	0.92	3355.2	31.4	0.408
57	TONOPAH	10183	56.82	0.82	3625.2	38.3	8.468
59	LAKE	5984	100.98	1.30	2377.4	45.3	15.049
60	VIRGINIA	219	0.18	1.43	2116.0	22.7	0.027
61	GERLACH	4343	41.82	1.22	2486.2	42.5	6.732
62	RENO	766	3.38	1.30	2428.2	34.5	0.504
63	SPARKS	621	3.81	1.29	2448.4	35.0	0.568
64	VERDI	73	0.06	1.43	2116.0	17.9	0.009
65	WADSWORTH	730	3.35	1.30	2431.0	34.5	0.499
67	BAKER	1168	9.59	0.82	3620.4	35.0	1.429
68	ELY	7190	54.53	0.84	3613.9	39.9	8.127
69	LUND	694	2.65	0.81	3634.1	29.4	0.395
TOTAL		109889	671.00				100.000

Table D-11c

1979 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1-230K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.12	1.43	0.0	21.0	0.001
02	NEW RIVER	5036	30.67	1.06	0.0	39.9	0.377
03	BUNKERVILLE	109	0.69	1.07	0.0	25.7	0.008
04	GOODSPRINGS	1095	10.50	0.91	0.0	36.4	0.129
05	HENDERSON	219	1.65	1.23	0.0	29.2	0.020
06	LAS VEGAS	1642	125.70	2.44	0.0	42.8	1.544
07	LOGAN	73	0.46	1.07	0.0	25.0	0.006
08	MESQUITE	219	1.38	1.07	0.0	27.3	0.017
09	MOAPA	1533	858.72	2.04	0.0	51.1	10.546
10	NELSON	730	6.16	0.88	0.0	33.2	0.076
11	N LAS VEGAS	511	3.52	1.77	0.0	31.3	0.043
12	OVERTON	1131	7.13	1.07	0.0	32.8	0.088
13	SEARCHLIGHT	803	7.36	0.84	0.0	34.1	0.090
15	EAST FORK	730	0.18	1.43	0.0	22.7	0.002
16	TAHOE	36	0.03	1.43	0.0	15.0	0.000
18	CARLIN	1606	5.06	0.91	0.0	33.2	0.062
19	EAST LINE	1533	15.12	0.85	0.0	37.4	0.186
20	ELKO	3467	21.16	0.90	0.0	39.4	0.260
21	JACKPOT	1168	3.71	0.83	0.0	31.1	0.046
22	JARRIDGE	365	0.80	0.98	0.0	25.8	0.010
23	MOUNTAIN CITY	3066	5.52	0.86	0.0	33.1	0.068
24	TECOMA	2043	7.97	0.81	0.0	34.1	0.098
25	WELLS	4161	29.45	0.87	0.0	39.8	0.362
27	ESMERALDA	3503	13.66	1.31	0.0	37.3	0.168
28	RENEWAL	1387	7.60	1.03	0.0	36.0	0.093
29	PIREKA	2773	12.02	0.88	0.0	36.7	0.148
31	GOLD RUN	1424	14.38	1.03	0.0	38.9	0.177
32	McDERMITT	1533	9.12	0.97	0.0	36.2	0.112
33	PARADISE VALY	1387	6.08	0.93	0.0	34.2	0.095
34	UNION	5621	46.50	1.10	0.0	41.6	0.571
36	ARGENTA	2519	23.04	1.05	0.0	41.0	0.283
37	AUSTIN	3138	19.99	0.89	0.0	39.0	0.246
39	ALAMO	3941	1839.06	2.27	0.0	50.2	22.086
40	CALIENTE	3066	3690.67	2.19	0.0	53.9	45.326
41	PANACA	621	205.72	2.20	0.0	48.2	2.527
42	PLOCHE	2737	140.24	2.10	0.0	40.9	1.722
44	CANAL	182	0.15	1.43	0.0	21.9	0.002
45	DAYTON	438	0.36	1.43	0.0	25.7	0.004
46	MASON VALLEY	876	1.20	1.09	0.0	28.3	0.015
47	SMITH VALLEY	474	0.12	1.43	0.0	21.0	0.001
49	HATHORNE	1971	5.03	0.86	0.0	32.7	0.062
50	MINA	1387	3.76	0.90	0.0	31.8	0.046
51	SCHUKZ	401	1.51	1.01	0.0	28.7	0.019
53	BEATTY	4526	308.64	2.48	0.0	44.2	3.790
54	GABBS	1569	6.55	0.93	0.0	34.5	0.080
55	FAHRUMP	292	1.64	2.10	0.0	30.8	0.020
56	ROUND MNTAIN	730	3.21	0.92	0.0	31.4	0.039
57	TUNOPAH	10183	418.82	2.00	0.0	42.6	5.144
59	LAKE	5984	100.98	1.30	0.0	45.3	1.240
60	VIRGINIA	219	0.18	1.43	0.0	22.7	0.002
61	GERLACH	4343	41.82	1.22	0.0	42.5	0.514
62	KENO	766	3.38	1.30	0.0	34.5	0.042
63	SPARKS	621	3.81	1.29	0.0	35.0	0.047
64	VERDI	73	0.06	1.43	0.0	18.0	0.001
65	WADSWORTH	730	3.35	1.30	0.0	34.5	0.041
67	BAKER	1168	9.59	0.82	0.0	35.1	0.118
68	ELY	7190	54.53	0.84	0.0	39.9	0.670
69	LUND	694	2.65	0.81	0.0	29.5	0.033
TOTAL		109889	8142.48				100.000

Table D-12a

1980 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLIN (dB)	Percent of Total Events
01	CARSON CITY	146	0.00	0.00	0.0	0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0	0.0	0.000
03	BUNKERVILLE	109	0.00	0.00	0.0	0.0	0.000
04	GOODSPRINGS	1095	1.80	1.68	73.3	22.3	0.024
05	HENDERSON	219	0.51	1.94	76.4	25.3	0.007
06	LAS VEGAS	1642	126.00	1.99	77.0	40.7	1.681
07	LOGAN	73	0.00	0.00	0.0	0.0	0.000
08	MESQUITE	219	0.00	0.00	0.0	0.0	0.000
09	MOAPA	1533	858.00	2.00	77.1	49.3	11.448
10	NELSON	730	0.42	1.64	72.6	17.5	0.006
11	N LAS VEGAS	511	2.58	2.00	77.1	28.9	0.034
12	OVERTON	1131	0.00	0.00	0.0	0.0	0.000
13	SEARCHLIGHT	803	0.64	1.64	72.6	18.9	0.009
15	EAST FORK	730	0.00	0.00	0.0	0.0	0.000
16	TAHOE	36	0.00	0.00	0.0	0.0	0.000
18	CARLIN	1606	0.00	0.00	0.0	0.0	0.000
19	EAST LINE	1533	0.84	2.10	80.0	19.9	0.011
20	ELKO	3467	0.00	0.00	0.0	0.0	0.000
21	JACKPOT	1168	0.00	0.00	0.0	0.0	0.000
22	JARBRIDGE	365	0.00	0.00	0.0	0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0	0.0	0.000
24	TECOMA	2043	0.06	2.10	80.0	7.2	0.001
25	WELLS	4161	0.76	2.10	80.0	15.1	0.010
27	ESMERALDA	3503	1.20	3.10	78.0	21.1	0.018
28	REDWAVE	1387	0.00	0.00	0.0	0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0	0.0	0.000
31	GOLD RUN	1424	0.00	0.00	0.0	0.0	0.000
32	McDERMITT	1533	0.00	0.00	0.0	0.0	0.000
33	PARADISE VALY	1387	0.00	0.00	0.0	0.0	0.000
34	UNION	5621	0.00	0.00	0.0	0.0	0.000
36	ARGENTA	2519	0.00	0.00	0.0	0.0	0.000
37	AUSTIN	3138	0.00	0.00	0.0	0.0	0.000
39	ALAMO	3941	1822.00	2.15	79.7	49.3	24.310
40	CALIENTE	3066	3690.00	2.20	79.5	53.7	49.233
41	PANACA	621	204.00	2.20	79.5	48.0	2.222
42	PLOCHE	2737	134.00	2.20	79.5	39.8	1.788
44	CANAL	182	0.00	0.00	0.0	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0	0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.0	0.000
49	HATHORNE	1971	0.00	0.00	0.0	0.0	0.000
50	MINA	1387	0.00	0.00	0.0	0.0	0.000
51	SCHURZ	401	0.00	0.00	0.0	0.0	0.000
53	BEATTY	4526	287.00	2.28	78.8	41.2	3.829
54	GABBS	1569	0.00	0.00	0.0	0.0	0.000
55	PAHRUMP	292	1.88	2.03	76.9	30.1	0.005
56	ROUND MNTAIN	730	0.00	0.00	0.0	0.0	0.000
57	TONOPAH	10183	363.00	2.33	78.8	38.8	4.843
59	LAKE	5984	0.00	0.00	0.0	0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0	0.0	0.000
61	GERLACH	4343	0.00	0.00	0.0	0.0	0.000
62	RENO	766	0.00	0.00	0.0	0.0	0.000
63	SPARKS	621	0.00	0.00	0.0	0.0	0.000
64	VERDI	73	0.00	0.00	0.0	0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0	0.0	0.000
67	BAKER	1168	0.00	0.00	0.0	0.0	0.000
68	ELY	7190	0.24	2.10	80.0	7.7	0.003
69	LUND	694	0.00	0.00	0.0	0.0	0.000
TOTAL		109889	7494.93				100.000

Table D-12b

1980 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude 20K ft, Mach Number 2.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.20	1.42	2177.6	23.1	0.036
02	NEW RIVER	5036	22.08	1.13	2849.3	39.0	3.974
03	BUNKERVILLE	109	0.75	0.83	3562.0	24.2	0.135
04	GOODSPRINGS	1095	6.90	0.99	3232.4	35.3	1.242
05	HENDERSON	219	1.26	0.87	3484.8	26.8	0.227
06	LAS VEGAS	1642	0.89	0.90	3434.2	25.6	0.160
07	LOGAN	73	0.50	0.83	3562.0	22.4	0.090
08	MESQUITE	219	1.50	0.83	3562.0	27.2	0.270
09	MOAPA	1533	4.26	0.83	3567.3	31.7	0.767
10	NELSON	730	5.18	0.88	3466.5	33.0	0.932
11	N LAS VEGAS	511	2.06	0.83	3564.5	28.5	0.371
12	OVERTON	1131	7.75	0.83	3562.0	34.3	1.395
13	SEARCHLIGHT	803	5.74	0.89	3430.0	33.6	1.033
15	EAST FORK	730	0.30	1.42	2177.6	24.8	0.054
16	TAHOE	36	0.05	1.42	2177.6	17.0	0.009
18	CARLIN	1606	6.02	0.95	3327.4	34.3	1.083
19	EAST LINE	1533	7.98	0.86	3523.6	34.7	1.436
20	ELKO	3467	15.30	0.87	3539.1	37.6	2.754
21	JACKPOT	1168	3.47	0.84	3573.2	30.9	0.625
22	JARBIDGE	365	1.30	0.92	3422.3	27.4	0.234
23	MOUNTAIN CITY	3066	9.12	0.94	3377.4	36.0	1.641
24	TEHOMA	2043	5.87	0.81	3637.7	32.8	1.056
25	WELLS	4161	18.39	0.85	3556.4	37.6	3.310
27	ESMERALDA	3503	9.23	1.03	3195.9	36.5	1.661
28	REDWAVE	1387	9.12	0.98	3183.1	36.4	1.641
29	FUREKA	2773	13.58	0.95	3360.6	37.9	2.444
31	GOLD RUN	1424	9.86	1.10	2941.4	37.8	1.775
32	McDERMITT	1533	9.08	1.32	2642.0	39.0	1.634
33	PARADISE VALY	1387	5.32	1.23	2804.3	36.0	0.957
34	UNION	5621	43.68	1.36	2473.4	42.5	7.861
36	ARGENTA	2519	19.36	1.02	3085.7	40.0	3.484
37	AUSTIN	3138	23.96	0.95	3317.2	40.4	4.312
39	ALAMO	3941	18.39	0.84	3621.3	37.8	3.346
40	CALIENTE	3066	10.07	0.81	3616.6	35.2	1.812
41	PANACA	621	1.53	0.80	3650.0	26.9	0.275
42	PIECHE	2737	7.39	0.80	3650.0	33.7	1.330
44	CANAL	182	0.25	1.42	2177.6	24.0	0.045
45	DAYTON	438	0.60	1.42	2177.6	27.8	0.104
46	MASON VALLEY	876	0.80	1.28	2544.2	28.2	0.144
47	SMITH VALLEY	474	0.20	1.42	2177.6	23.1	0.045
49	HATHURNE	1971	2.75	1.01	3437.2	31.5	0.485
50	MINA	1387	2.52	0.99	3330.2	30.9	0.414
51	SCHURZ	401	0.75	1.18	2849.2	27.2	0.135
53	BEATTY	4526	10.99	0.95	3451.6	35.7	1.773
54	GARBS	1569	6.74	0.90	3419.3	34.3	1.213
55	PAHRUMP	292	0.32	1.09	3249.9	22.8	0.053
56	ROUND MNTAIN	730	3.30	0.89	3436.0	31.1	0.594
57	TONOPAH	10183	42.55	0.83	3606.6	37.1	7.658
59	LANE	5984	73.12	1.30	2447.3	44.0	13.160
60	VIRGINIA	219	0.30	1.42	2177.6	24.8	0.054
61	GERSLACH	4343	13.86	1.58	1768.0	43.5	7.894
62	LENO	766	4.10	1.58	1914.2	37.1	0.738
63	SPARKS	621	4.51	1.60	1890.2	37.6	0.817
64	VERDI	73	0.10	1.42	2177.6	20.0	0.018
65	WADSWORTH	730	4.05	1.58	1910.9	37.1	0.729
67	BAKER	1168	6.98	0.80	3650.0	33.5	1.256
68	ELY	7190	36.78	0.83	3623.5	38.1	6.670
69	LUND	694	2.42	0.81	3643.4	29.0	0.436
TOTAL		109889	555.63				100.000

Table D-12c

1980 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1->30K ft , Mach Number >1.0

TOWNSHIP DATA		SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)		
01	CARSON CITY	146	0.20	1.42	0.0	23.1	0.002
02	NEW RIVER	5036	22.08	1.13	0.0	39.0	0.274
03	BUNKERVILLE	109	0.75	0.83	0.0	24.2	0.009
04	GOODSPRINGS	1095	8.70	1.13	0.0	35.5	0.108
05	HENDERSON	219	1.77	1.18	0.0	29.1	0.022
06	LAS VEGAS	1642	126.89	1.94	0.0	40.8	1.576
07	LOGAN	73	0.50	0.83	0.0	22.4	0.006
08	MESQUITE	219	1.50	0.83	0.0	27.2	0.019
09	MOAPA	1533	862.26	1.67	0.0	49.4	10.711
10	NELSON	730	5.60	0.93	0.0	33.1	0.070
11	N LAS VEGAS	511	4.64	1.48	0.0	31.7	0.058
12	VERTON	1131	7.75	0.83	0.0	34.3	0.096
13	SEARCHLIGHT	803	6.38	0.97	0.0	33.8	0.079
15	EAST FORK	730	0.30	1.42	0.0	24.8	0.004
16	TAHOE	36	0.05	1.42	0.0	17.1	0.001
18	CARLIN	1606	6.02	0.95	0.0	34.3	0.075
19	EAST LINE	1533	8.82	0.98	0.0	34.8	0.110
20	ELKO	3467	15.30	0.87	0.0	37.6	0.190
21	JACKPOT	1168	3.47	0.84	0.0	30.9	0.045
22	JARBRIDGE	365	1.30	0.92	0.0	27.4	0.015
23	MOUNTAIN CITY	3066	9.12	0.94	0.0	36.0	0.115
24	TECOMA	2043	5.93	0.82	0.0	32.8	0.074
25	WELLS	4161	19.15	0.90	0.0	37.6	0.238
27	ESMERALDA	3503	10.43	1.27	0.0	36.6	0.150
28	BEOWAWE	1387	9.12	0.98	0.0	36.4	0.113
29	EUREKA	2773	13.58	0.95	0.0	37.9	0.169
31	GOLD RUN	1424	9.86	1.10	0.0	37.8	0.122
32	McDERMITT	1533	9.08	1.32	0.0	39.0	0.113
33	PARADISE VALY	1387	5.32	1.23	0.0	36.0	0.066
34	UNION	5621	43.68	1.36	0.0	42.5	0.543
36	ARGENTA	2519	19.36	1.02	0.0	40.0	0.240
37	AUSTIN	3138	23.96	0.95	0.0	40.4	0.298
39	ALAMO	3941	1840.59	2.13	0.0	49.6	22.863
40	CALIENTE	3066	3700.07	2.18	0.0	53.7	45.960
41	PANACA	621	205.53	2.19	0.0	48.1	2.553
42	PIOCHE	2737	141.39	2.10	0.0	40.7	1.756
44	CANAL	182	0.25	1.42	0.0	24.0	0.003
45	DAYTON	438	0.60	1.42	0.0	27.8	0.007
46	MASON VALLEY	876	0.80	1.28	0.0	28.2	0.010
47	SMITH VALLEY	474	0.20	1.42	0.0	23.1	0.002
49	HATHORNE	1971	2.75	1.01	0.0	31.5	0.034
50	MINA	1387	2.52	0.99	0.0	30.9	0.031
51	SCHURZ	401	0.75	1.18	0.0	27.2	0.009
53	BEATTY	4526	297.99	2.11	0.0	42.3	3.791
54	GABBS	1569	6.74	0.90	0.0	34.3	0.084
55	FAHRUMP	292	2.20	1.89	0.0	30.8	0.027
56	ROUND MNTAIN	730	3.30	0.89	0.0	31.1	0.041
57	TONOPAH	10183	405.55	1.61	0.0	41.1	5.038
59	LAKE	5984	73.12	1.30	0.0	44.0	0.908
60	VIRGINIA	219	0.30	1.42	0.0	24.8	0.004
61	GERLACH	4343	43.86	1.58	0.0	43.5	0.545
62	RENO	766	4.10	1.58	0.0	37.1	0.051
63	SPARKS	621	4.51	1.60	0.0	37.6	0.056
64	VERDI	73	0.10	1.42	0.0	20.1	0.001
65	WADSWORTH	730	4.05	1.58	0.0	37.1	0.050
67	BAKER	1168	6.98	0.80	0.0	33.5	0.087
68	ELY	7190	37.02	0.84	0.0	38.1	0.460
69	LUND	694	2.42	0.81	0.0	29.0	0.030
TOTAL		109889	8050.56				100.000

Table D-13a

1981 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA		SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)
						Percent of Total Events
01	CARSON CITY	146	0.00	0.00	0.0	0.000
02	NEW RIVER	5036	0.37	3.10	78.0	0.005
03	BUNKERVILLE	109	0.03	1.60	72.0	0.000
04	GOODSPRINGS	1095	2.10	1.60	72.0	0.026
05	HENDERSON	219	0.95	2.27	74.7	0.012
06	LAS VEGAS	1642	134.00	2.35	75.0	1.675
07	LUGAN	73	0.02	1.60	72.0	0.000
08	MESQUITE	219	0.06	1.60	72.0	0.001
09	MOAPA	1533	911.00	2.34	75.0	11.385
10	NELSON	730	0.62	1.99	74.7	0.008
11	N LAS VEGAS	511	5.00	2.34	75.0	0.062
12	VERTON	1131	0.31	1.60	72.0	0.004
13	SEARCHLIGHT	803	0.86	2.00	74.8	0.011
15	EAST FORK	730	0.00	0.00	0.0	0.000
16	TAHOE	36	0.00	0.00	0.0	0.000
18	CARLIN	1606	0.00	0.00	0.0	0.000
19	EAST LINE	1533	0.84	1.85	76.0	0.010
20	ELKO	3467	0.00	0.00	0.0	0.000
21	JACKPOT	1168	0.23	1.60	72.0	0.003
22	BARBRIDGE	365	0.00	0.00	0.0	0.000
23	MOUNTAIN CITY	3066	0.00	0.00	0.0	0.000
24	TECUMA	2043	0.59	1.63	72.4	0.007
25	WELLS	4161	0.97	1.80	75.1	0.012
27	ESMERALDA	3503	39.60	3.15	76.4	0.495
28	BEOWAWE	1387	0.00	0.00	0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0	0.000
31	GOLD RUN	1424	0.00	0.00	0.0	0.000
32	MCDERMITT	1533	0.00	0.00	0.0	0.000
33	PARADISE VALLEY	1387	0.00	0.00	0.0	0.000
34	UNION	5621	0.00	0.00	0.0	0.000
36	ARGENTA	2519	0.00	0.00	0.0	0.000
37	AUSTIN	3138	0.53	3.10	78.0	0.007
39	ALAMO	3941	1914.00	2.25	79.6	24.120
40	CALIDENTE	3066	3915.00	2.32	79.3	48.928
41	PANOLA	621	217.00	2.32	79.3	2.712
42	PIECHE	2737	142.00	2.32	79.3	1.775
44	CANAL	182	0.00	0.00	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.000
49	HATHORNE	1971	0.00	0.00	0.0	0.000
50	MINA	1387	0.00	0.00	0.0	0.000
51	SCHURZ	401	0.00	0.00	0.0	0.000
53	BEATTY	4526	305.00	2.64	77.4	3.812
54	GARBS	1569	0.07	3.10	78.0	0.001
55	PAHRUMP	292	3.36	2.33	74.9	0.042
56	ROUND MOUNTAIN	730	0.06	2.52	77.7	0.001
57	TUNOFAH	10183	386.00	2.74	77.3	4.824
59	LANE	5984	0.00	0.00	0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0	0.000
61	GERLACH	4343	0.00	0.00	0.0	0.000
62	RENO	766	0.00	0.00	0.0	0.000
63	SPARKS	621	0.00	0.00	0.0	0.000
64	VERDI	73	0.00	0.00	0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0	0.000
67	BAKER	1168	0.00	0.00	0.0	0.000
68	FLY	7190	0.24	1.85	76.0	0.003
69	LUND	694	0.80	3.10	78.0	0.010
TOTAL		109889	3001.61			100.000

Table D-13b

1981 SR71 AIRCRAFT ONLY

09-JAN-86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				CLDN (dB)	Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)			
01	CARSON CITY	146	0.48	1.52	2126.3	27.4	0.061	
02	NEW RIVER	5036	36.05	1.00	3159.6	40.5	4.573	
03	BUNKERVILLE	109	0.60	0.80	3650.0	22.8	0.076	
04	GOODSPRINGS	1095	6.30	0.91	3480.5	34.2	0.799	
05	HENDERSON	219	0.96	0.83	3608.7	25.2	0.122	
06	LAS VEGAS	1642	0.42	0.91	3480.5	22.5	0.053	
07	LOGAN	73	0.40	0.80	3650.0	21.1	0.051	
08	MESQUITE	219	1.20	0.80	3650.0	25.9	0.152	
09	MOAPA	1533	3.20	0.80	3650.0	30.1	0.406	
10	NELSON	730	3.43	0.84	3604.9	30.9	0.435	
11	N LAS VEGAS	511	1.60	0.80	3650.0	27.1	0.203	
12	OVERTON	1131	6.20	0.80	3650.0	33.0	0.787	
13	SEARCHLIGHT	803	3.60	0.86	3581.7	31.3	0.457	
15	FAST FORK	730	1.14	1.81	1597.2	32.7	0.145	
16	TAHOE	36	0.12	1.52	2126.3	21.4	0.015	
18	CARLIN	1606	5.43	1.07	3117.2	34.9	0.809	
19	EAST LINE	1533	17.22	0.82	3596.3	37.6	2.185	
20	ELKO	3467	15.66	1.04	3172.7	38.9	1.987	
21	JACKPOT	1168	2.55	1.14	2897.9	32.2	0.324	
22	JARBRIDGE	365	1.30	1.09	3025.3	28.9	0.165	
23	MOUNTAIN CITY	3066	9.12	1.00	3241.6	36.6	1.157	
24	TECOMA	2043	4.41	1.08	3014.8	34.1	0.559	
25	WELLS	4161	26.23	0.92	3406.0	39.6	3.333	
27	ESMERALDA	3503	7.65	1.69	1863.3	37.6	0.771	
28	REUNAWA	1387	6.46	1.34	2572.1	37.6	0.820	
29	EUREKA	2773	16.42	0.94	3316.4	38.6	2.083	
31	GOLD RUN	1424	10.08	1.25	2608.7	39.0	1.379	
32	McDERMITT	1533	21.24	1.68	1871.7	44.8	2.605	
33	PARADISE VALY	1387	5.32	1.37	2372.6	37.0	0.675	
34	UNION	5621	120.57	1.74	1751.9	47.6	15.295	
36	ARGENTA	2519	16.77	1.26	2636.1	41.3	2.127	
37	AUSTIN	3138	23.69	0.93	3343.2	40.1	3.005	
39	ALAMO	3941	14.54	0.90	3373.0	47.0	1.345	
40	CALIENTE	3066	19.48	0.80	3647.7	38.0	2.471	
41	PANACA	621	4.08	0.80	3650.0	31.2	0.518	
42	PIOCHE	2737	12.24	0.84	3534.9	36.4	1.573	
44	CANAL	182	0.60	1.52	2126.3	28.4	0.056	
45	DAYTON	438	1.44	1.52	2126.3	32.2	0.133	
46	MASON VALLEY	876	2.11	1.41	2337.0	33.2	0.150	
47	SMITH VALLEY	474	0.75	1.80	1609.3	30.8	0.095	
49	HATHORNE	1971	4.12	1.22	2652.1	34.9	0.523	
50	MINA	1387	3.16	1.20	2698.6	33.5	0.401	
51	SCHURZ	401	1.53	1.08	2962.7	29.5	0.174	
53	BEATTY	4526	14.04	1.14	2935.5	37.7	1.331	
54	GABBS	1569	5.33	1.07	3026.6	34.0	0.876	
55	FAHRUMP	292	0.48	1.17	2939.9	29.2	0.081	
56	ROUND MNTAIN	730	2.61	1.06	3043.2	31.7	0.331	
57	TONOPAH	10183	42.02	1.00	3149.8	38.2	5.331	
59	LAKE	5984	110.70	1.48	2093.9	46.3	14.044	
60	VIRGINIA	219	0.72	1.52	2126.3	29.2	0.091	
61	GERLACH	4343	85.17	1.89	1212.0	46.3	10.305	
62	RENO	766	7.27	1.80	1553.1	40.7	0.922	
63	SPARKS	621	7.74	1.84	1480.2	41.2	0.982	
64	VERDI	73	0.24	1.52	2126.3	24.4	0.030	
65	WADSWORTH	730	7.15	1.81	1543.5	40.7	0.907	
67	BAKER	1168	8.79	0.84	3565.1	34.9	1.115	
68	ELY	7190	54.53	0.84	3581.1	39.8	6.913	
69	LUND	694	1.59	0.89	3409.6	28.0	0.202	
TOTAL		109889	788.25					100.000

Table D-13c

1981 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1-230K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	0.48	1.52	0.0	27.4	0.005
02	NEW RIVER	5036	36.42	1.02	0.0	40.6	0.414
03	BUNKERVILLE	109	0.63	0.84	0.0	23.4	0.007
04	GOODSPRINGS	1095	8.40	1.09	0.0	34.5	0.096
05	HENDERSON	219	1.91	1.55	0.0	30.7	0.022
06	LAS VEGAS	1642	134.42	2.33	0.0	42.3	1.529
07	LOGAN	73	0.42	0.84	0.0	21.9	0.005
08	MESQUITE	219	1.26	0.84	0.0	26.1	0.014
09	MOAPA	1533	914.20	2.14	0.0	50.9	10.401
10	NELSON	730	4.05	1.02	0.0	31.3	0.046
11	N LAS VEGAS	511	6.60	1.97	0.0	34.0	0.075
12	OVERTON	1131	6.51	0.84	0.0	33.0	0.074
13	SEARCHLIGHT	803	4.46	1.08	0.0	31.8	0.051
15	EAST FORK	730	1.14	1.81	0.0	32.7	0.013
16	TAHOE	36	0.12	1.52	0.0	21.4	0.001
18	DARLIN	1606	5.43	1.07	0.0	34.9	0.062
19	EAST LINE	1533	18.06	0.87	0.0	37.7	0.005
20	ELKO	3467	15.66	1.04	0.0	38.9	0.178
21	JACKPOT	1168	2.78	1.18	0.0	32.3	0.032
22	JARRIDGE	365	1.30	1.09	0.0	28.9	0.015
23	MOUNTAIN CITY	3066	9.12	1.00	0.0	36.6	0.104
24	TECOMA	2043	5.00	1.15	0.0	34.2	0.057
25	WELLS	4161	27.20	0.95	0.0	39.6	0.309
27	ESMERALDA	3503	47.25	2.91	0.0	40.0	0.368
28	REDWAVE	1387	6.46	1.34	0.0	37.6	0.073
29	BUKENA	2773	16.42	0.94	0.0	38.6	0.187
31	GOLD RUN	1424	10.08	1.25	0.0	39.0	0.115
32	McDERMITT	1533	21.24	1.68	0.0	44.8	0.242
33	PARADISE VALY	1387	5.32	1.37	0.0	37.0	0.061
34	UNION	5621	120.57	1.74	0.0	47.6	1.372
36	ARGENTA	2519	16.77	1.26	0.0	41.3	0.191
37	AUSTIN	3138	24.22	0.98	0.0	40.2	0.276
39	ALAMO	3941	1948.54	2.22	0.0	50.2	22.168
40	CALIENTE	3066	3934.48	2.28	0.0	54.5	44.162
41	PANACA	621	221.08	2.29	0.0	48.8	2.515
42	PIEDMONT	2737	154.24	2.19	0.0	41.9	1.295
44	CANAL	182	0.60	1.52	0.0	28.4	0.001
45	DAYTON	438	1.44	1.52	0.0	32.2	0.018
46	MASON VALLEY	876	2.11	1.41	0.0	33.2	0.024
47	SMITH VALLEY	474	0.75	1.80	0.0	30.9	0.009
49	HATHURNE	1971	4.12	1.22	0.0	34.9	0.041
50	MINA	1387	3.16	1.20	0.0	33.6	0.036
51	SCHURZ	401	1.53	1.08	0.0	29.5	0.017
53	BEATTY	4526	319.04	2.43	0.0	43.8	3.850
54	HARRIS	1569	5.40	1.09	0.0	34.9	0.051
55	FAHRUMP	292	1.84	2.19	0.0	34.3	0.044
56	ROUND MNTAIN	730	2.67	1.09	0.0	31.7	0.030
57	TONGVAH	10183	428.02	2.04	0.0	42.4	4.869
59	LAKE	5984	110.70	1.48	0.0	46.3	1.249
60	VIRGINIA	219	0.72	1.52	0.0	29.2	0.008
61	GERLACH	4343	85.17	1.89	0.0	46.3	0.289
62	LENO	766	7.27	1.80	0.0	40.7	0.083
63	SHANNS	621	7.74	1.84	0.0	41.2	0.088
64	VERDE	73	0.24	1.52	0.0	24.4	0.003
65	WADSWORTH	730	7.15	1.81	0.0	40.7	0.081
67	BAKER	1168	8.79	0.84	0.0	34.9	0.100
68	FLY	7190	54.77	0.84	0.0	39.8	0.523
69	CUNU	694	2.39	1.63	0.0	30.3	0.027
TOTAL		109889	8789.86				100.000

Table D-14a

1982 TACTICAL AIRCRAFT ONLY

07- JAN-86

Altitude .1-230k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	0.00	0.00	0.0	0.0	0.000
02	NEW RIVER	5036	1.48	1.97	78.0	16.5	0.013
03	BUNKERVILLE	109	0.42	2.82	72.4	30.5	0.005
04	GOODSPRINGS	1095	1.20	1.60	72.0	20.1	0.015
05	HENDERSON	219	0.76	2.64	73.8	29.5	0.005
06	LAS VEGAS	1642	137.00	2.51	75.8	43.0	1.679
07	LOGAN	73	0.28	2.82	72.4	30.4	0.003
08	MESQUITE	219	0.84	2.82	72.4	30.4	0.010
09	MOAPA	1533	933.00	2.58	75.1	51.8	11.485
10	NELSON	730	0.82	2.64	72.4	24.5	0.010
11	N LAS VEGAS	511	2.92	2.63	74.5	31.7	0.036
12	OVERTON	1131	4.34	2.82	72.4	30.4	0.055
13	SEARCHLIGHT	803	0.20	1.60	72.0	13.6	0.002
15	EAST FORK	730	0.00	0.00	0.0	0.0	0.000
16	TAHOE	36	0.00	0.00	0.0	0.0	0.000
18	CARLIN	1606	0.62	2.10	80.0	18.3	0.003
19	EAST LINE	1533	0.00	0.00	0.0	0.0	0.000
20	ELKO	3467	0.86	2.50	79.2	17.9	0.011
21	JACKPOT	1168	0.41	2.04	75.1	17.4	0.005
22	JARBRIDGE	365	0.20	2.60	79.0	21.7	0.002
23	MOUNTAIN CITY	3066	1.68	2.24	79.7	26.4	0.011
24	TECUMA	2043	0.53	1.60	72.0	15.8	0.005
25	WELLS	4161	0.67	2.29	76.8	15.1	0.005
27	ESMERALDA	3503	2.73	2.92	77.3	24.1	0.015
28	BEOHAVE	1387	0.00	0.00	0.0	0.0	0.000
29	EUREKA	2773	0.00	0.00	0.0	0.0	0.000
31	GOLD RUN	1424	0.00	0.00	0.0	0.0	0.000
32	MCDERMITT	1533	0.00	0.00	0.0	0.0	0.000
33	PARADISE VALY	1387	0.00	0.00	0.0	0.0	0.000
34	UNION	5621	0.00	0.00	0.0	0.0	0.000
36	ARGENTA	2519	0.00	0.00	0.0	0.0	0.000
37	AUSTIN	3138	2.12	1.98	78.0	20.1	0.025
39	ALAMO	3941	1980.00	2.71	78.3	51.5	24.268
40	CALIENTE	3066	4008.00	2.93	78.1	56.1	42.124
41	PANACA	621	222.00	2.83	78.1	50.5	2.521
42	PIOCHE	2737	146.00	2.83	78.1	42.2	1.529
44	CANAL	182	0.00	0.00	0.0	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0	0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.0	0.000
49	HATHORNE	1971	0.00	0.00	0.0	0.0	0.000
50	MINA	1387	0.12	1.60	72.0	25.9	0.001
51	SCHURZ	401	0.00	0.00	0.0	0.0	0.000
53	BEATTY	4526	312.00	2.29	75.7	41.4	5.324
54	GABBS	1569	0.28	1.97	78.0	14.3	0.005
55	FAHRUMP	292	1.28	2.51	75.8	36.2	0.015
56	ROUND MNTAIN	730	0.13	1.95	77.5	14.2	0.002
57	TONOPAH	10183	395.00	2.45	76.0	39.5	4.841
59	LAKE	5984	0.00	0.00	0.0	0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0	0.0	0.000
61	GERLACH	4343	0.00	0.00	0.0	0.0	0.000
62	RENO	766	0.00	0.00	0.0	0.0	0.000
63	SPARKS	621	0.00	0.00	0.0	0.0	0.000
64	VERDI	73	0.00	0.00	0.0	0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0	0.0	0.000
67	BAKER	1168	0.00	0.00	0.0	0.0	0.000
68	ELY	7190	0.00	0.00	0.0	0.0	0.000
69	LUND	694	1.12	3.10	78.0	27.8	0.014
TOTAL		109889	8159.01				100.000

Table D-14b

1982 SK71 AIRCRAFT ONLY

09-JAN-86

Altitude -20K ft, Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (Yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.40	1.47	2281.8	26.4	0.043
02	NEW RIVER	5036	41.01	0.89	3436.4	40.5	4.431
03	BURNERVILLE	109	0.78	0.80	3650.0	24.0	0.008
04	CLARKSPRINGS	1095	7.80	1.10	2934.3	36.8	0.843
05	HENDERSON	219	1.45	0.86	3514.8	27.4	0.157
06	LAS VEGAS	1642	0.95	0.97	3258.3	26.5	0.103
07	LOGAN	73	0.52	0.80	3650.0	22.2	0.056
08	MESQUITE	219	1.56	0.80	3650.0	27.0	0.169
09	MUHAM	1533	4.42	0.80	3650.0	31.5	0.418
10	NELSON	730	6.98	0.86	3551.4	34.1	0.743
11	N LAS VEGAS	511	2.14	0.80	3650.0	28.4	0.231
12	OVERTON	1131	8.06	0.80	3650.0	34.1	0.871
13	SEARCHLIGHT	803	8.10	0.88	3514.1	35.0	0.875
14	EAST FORK	730	0.74	1.63	1980.6	29.9	0.080
15	TARHE	36	0.10	1.47	2281.8	20.3	0.011
16	CORLIN	1606	5.81	0.99	3201.6	34.6	0.628
17	EAST LINE	1533	10.08	0.81	3641.7	35.2	1.039
18	BLIND	3467	17.90	0.85	3551.6	38.6	2.150
19	JACKFUT	1168	5.30	0.81	3641.3	37.4	0.923
20	JACKRIDGE	365	1.80	0.80	3650.0	27.6	0.194
21	MOUNTAIN CITY	3066	10.32	0.82	3638.4	35.4	1.115
22	HELENA	2043	7.20	0.82	3637.8	34.9	0.974
23	WELLS	4151	24.62	0.83	3608.8	38.7	2.859
24	EMERALDA	3503	2.99	1.00	3182.4	35.6	0.863
25	GEOROWE	1487	7.22	1.35	2228.3	38.2	0.780
26	HELENA	2773	21.58	0.89	3493.3	39.4	2.512
27	GOLD RUN	1424	14.99	1.32	1376.3	41.2	1.819
28	MCDONNITT	1533	11.70	1.69	1919.1	44.9	2.544
29	CANADIAN VALLEY	1387	6.46	1.36	2581.8	37.8	0.898
30	UNION	5671	124.24	1.71	1825.8	47.7	13.413
31	ARGENTIA	2519	23.19	1.33	2294.0	42.7	2.509
32	AUSTIN	3138	20.70	0.88	3548.0	39.0	2.756
33	ALABAMA	3941	13.74	1.09	3066.8	38.1	1.484
34	CALIENTE	3066	24.45	0.80	3646.4	39.0	2.842
35	CANACA	621	5.10	0.80	3650.0	32.1	0.851
36	PIEDMONT	2737	12.26	0.80	3650.0	35.9	1.375
37	CANAL	182	0.50	1.47	2281.8	27.3	0.054
38	DAYTON	438	1.20	1.47	2281.8	31.1	0.130
39	MASON VALLEY	876	2.35	1.11	3020.6	31.6	0.254
40	SMITH VALLEY	474	0.49	1.62	1989.4	38.1	0.053
41	HATHORNE	1971	7.87	0.94	3411.7	35.5	0.850
42	MINA	1387	5.96	0.96	3351.3	34.4	0.644
43	GRUNZ	401	2.42	0.90	3443.7	29.9	0.261
44	BEATTY	4526	14.77	0.90	3419.3	36.6	1.596
45	GARBS	1569	2.79	0.89	3481.0	34.9	0.842
46	FAHRUMP	292	0.08	1.20	2549.5	17.6	0.009
47	ROUND MNTAIN	730	3.71	0.88	3495.2	31.6	0.401
48	TONGVAH	10183	46.12	0.85	3552.6	37.6	4.983
49	LAKE	5984	154.46	1.51	2036.5	42.2	14.712
50	VIRGINIA	219	0.80	1.47	2281.8	29.1	0.055
51	DELLACH	4343	26.39	1.81	1319.5	46.8	10.414
52	KEND	766	7.65	1.85	1421.9	41.2	0.828
53	SHARKS	671	8.36	1.89	1337.6	41.8	0.903
54	VERDI	73	0.20	1.47	2281.8	23.4	0.022
55	WADSWORTH	730	7.55	1.86	1410.5	41.2	0.816
56	BAKER	1168	15.19	0.80	3647.2	36.9	1.541
57	FLY	7190	84.64	0.82	3634.5	41.6	9.144
58	LUND	694	1.64	0.90	3423.1	28.2	0.177
TOTAL		109889	725.60				100.000

Table D-14c

1982 ALL SUPERSONIC AIRCRAFT

07 JAN 83

Altitude .1-30K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	FLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.40	1.47	0.0	26.4	0.004
02	NEW RIVER	5036	42.49	0.93	0.0	40.5	0.443
03	BUNKERVILLE	109	1.20	1.51	0.0	31.3	0.013
04	GOODSPRINGS	1095	9.00	1.17	0.0	36.9	0.099
05	HENDERSON	219	2.21	1.47	0.0	31.6	0.024
06	LAS VEGAS	1642	137.95	2.41	0.0	43.1	1.519
07	LOGAN	73	0.80	1.51	0.0	31.1	0.007
08	MESQUITE	219	2.40	1.51	0.0	32.1	0.006
09	MURFA	1533	937.42	2.04	0.0	41.9	10.000
10	NELSON	730	7.70	1.05	0.0	33.5	0.020
11	N LAS VEGAS	511	5.06	1.86	0.0	33.4	0.006
12	OVERTON	1131	12.40	1.51	0.0	35.7	0.150
13	SEARCHLIGHT	803	9.30	0.90	0.0	35.0	0.081
14	EAST FORK	730	0.74	1.63	0.0	29.7	0.003
15	LAHUE	36	0.10	1.47	0.0	20.4	0.001
16	CARLIN	1606	6.43	1.10	0.0	34.7	0.004
17	EAST LINE	1533	10.08	0.81	0.0	30.2	0.117
18	ELKO	3467	20.76	0.92	0.0	38.7	0.007
19	JACKPOT	1168	5.71	0.90	0.0	37.6	0.006
20	JARBRIDGE	345	2.00	0.98	0.0	33.6	0.003
21	MOUNTAIN CITY	3066	12.00	1.02	0.0	33.6	0.003
22	TECOMA	2043	9.73	0.86	0.0	35.5	0.003
23	WELLS	4161	25.29	0.87	0.0	34.9	0.100
24	ESMERALDA	3503	10.72	1.49	0.0	35.9	0.003
25	BEOWAWE	1387	7.22	1.35	0.0	35.2	0.008
26	EUREKA	2773	21.68	0.89	0.0	39.4	0.007
27	GOLD RUN	1424	14.99	1.32	0.0	41.7	0.007
28	MCDERMITT	1533	21.70	1.69	0.0	44.9	0.007
29	PARADISE VALY	1387	6.46	1.36	0.0	37.8	0.007
30	UNION	5621	124.24	1.71	0.0	47.7	1.000
31	ARGENTA	2519	23.19	1.33	0.0	47.7	0.007
32	AUSTIN	3138	22.82	0.98	0.0	39.1	0.004
33	ALAMO	3741	1993.74	2.55	0.0	43.8	1.000
34	CALIENTE	3066	4032.45	2.67	0.0	50.2	10.000
35	PANACA	621	227.10	2.69	0.0	50.6	0.007
36	FLOCHE	2737	158.26	2.40	0.0	45.2	1.000
37	CANAL	182	0.50	1.47	0.0	27.3	0.001
38	DAYTON	438	1.20	1.47	0.0	41.1	0.001
39	MASON VALLEY	876	2.35	1.11	0.0	31.5	0.001
40	SMITH VALLEY	474	0.49	1.62	0.0	38.1	0.000
41	HATHORNE	1971	7.87	0.94	0.0	35.5	0.000
42	MINA	1387	6.08	0.97	0.0	34.4	0.000
43	SCHURZ	401	2.42	0.90	0.0	29.9	0.000
44	BEATTY	4526	326.77	1.64	0.0	40.6	0.007
45	GARBS	1569	8.07	0.93	0.0	30.0	0.000
46	FAHRUMP	292	1.36	2.43	0.0	30.4	0.000
47	ROUND MNTAIN	730	3.84	0.92	0.0	41.7	0.004
48	TONOPAH	10183	441.12	1.28	0.0	41.7	0.006
49	LAKE	5984	134.46	1.51	0.0	47.7	1.000
50	VIRGINIA	219	0.60	1.47	0.0	34.1	0.000
51	GERLACH	4343	96.39	1.81	0.0	40.8	1.000
52	RENO	766	7.65	1.85	0.0	41.2	0.004
53	SPARKS	621	8.36	1.89	0.0	41.2	0.004
54	VERDI	73	0.20	1.47	0.0	23.4	0.000
55	WADSWORTH	730	7.55	1.86	0.0	41.2	0.003
56	BAKER	1168	15.19	0.80	0.0	36.9	0.007
57	ELY	7190	84.64	0.82	0.0	41.8	0.007
58	LUND	674	2.76	1.79	0.0	31.0	0.003
TOTAL		109889	9034.61				100.000

Table D-15a

1983 TACTICAL AIRCRAFT ONLY

09-JAN-86

Altitude .1->30k ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	CARSON CITY	146	0.00	0.00	0.0	0.0	0.000
02	NEW RIVER	5036	0.00	0.00	0.0	0.0	0.000
03	BUNKERVILLE	109	0.06	1.60	72.0	17.1	0.001
04	GOODSPRINGS	1095	0.00	0.00	0.0	0.0	0.000
05	HENDERSON	219	0.45	2.46	75.7	26.7	0.005
06	LAS VEGAS	1642	144.00	2.61	76.1	43.6	1.677
07	LOGAN	73	0.04	1.60	72.0	17.0	0.000
08	MESQUITE	219	0.12	1.60	72.0	17.0	0.001
09	MUAPA	1533	983.00	2.58	75.9	52.1	11.446
10	NELSON	730	0.34	1.95	77.6	18.4	0.004
11	N LAS VEGAS	511	2.38	2.55	75.8	30.6	0.028
12	OVERTON	1131	0.62	1.60	72.0	17.0	0.007
13	SEARCHLIGHT	803	0.34	2.10	80.0	18.7	0.004
15	EAST FORK	730	0.00	0.00	0.0	0.0	0.000
16	TAHOE	36	0.00	0.00	0.0	0.0	0.000
18	EARLIN	1606	0.44	1.65	72.7	14.3	0.005
19	EAST LINE	1533	0.00	0.00	0.0	0.0	0.000
20	ELKO	3467	0.61	2.01	78.6	14.5	0.007
21	JACKPOT	1168	0.23	2.10	80.0	15.4	0.003
22	JARRIDGE	365	0.00	0.00	0.0	0.0	0.000
23	MOUNTAIN CITY	3066	0.60	1.60	72.0	12.6	0.007
24	TECOMA	2043	0.53	2.10	80.0	16.6	0.006
25	WELLS	4161	0.53	2.10	80.0	13.5	0.006
27	ESMERALDA	3503	4.20	2.67	78.9	25.3	0.049
28	BEOWAWE	1387	0.38	1.60	72.0	14.0	0.004
29	FOKERA	2773	0.12	1.68	73.3	6.5	0.001
31	GOLD RUN	1424	0.17	1.60	72.0	10.4	0.002
32	MCDERMITT	1533	0.26	1.60	72.0	12.0	0.003
33	PARADISE VALY	1387	0.38	1.60	72.0	14.0	0.004
34	UNION	5621	0.19	1.60	72.0	4.9	0.002
36	ARGENTA	2519	0.41	1.60	72.0	11.8	0.005
37	AUSTIN	3138	0.00	0.00	0.0	0.0	0.000
39	ALAMO	3941	2088.00	2.35	79.4	50.6	24.313
40	CALIFENTE	3066	4225.00	2.21	79.8	54.3	49.196
41	PANACA	621	234.00	2.21	79.8	48.6	2.725
42	PIECHE	2737	153.00	2.21	79.8	40.4	1.782
44	CANAL	182	0.00	0.00	0.0	0.0	0.000
45	DAYTON	438	0.00	0.00	0.0	0.0	0.000
46	MASON VALLEY	876	0.00	0.00	0.0	0.0	0.000
47	SMITH VALLEY	474	0.00	0.00	0.0	0.0	0.000
49	HATHURNE	1971	0.00	0.00	0.0	0.0	0.000
50	MINA	1387	0.00	0.00	0.0	0.0	0.000
51	SCHURZ	401	0.00	0.00	0.0	0.0	0.000
53	BEATTY	4526	329.00	2.36	78.4	42.0	3.831
54	GABBS	1569	0.00	0.00	0.0	0.0	0.000
55	FAHRUMP	292	1.52	2.63	76.1	31.4	0.019
56	ROUND MNTAIN	730	0.00	0.00	0.0	0.0	0.000
57	TONOPAH	10183	417.00	2.33	78.5	39.4	4.856
59	LAKE	5984	0.00	0.00	0.0	0.0	0.000
60	VIRGINIA	219	0.00	0.00	0.0	0.0	0.000
61	GERLACH	4343	0.00	0.00	0.0	0.0	0.000
62	BEND	766	0.00	0.00	0.0	0.0	0.000
63	SPARNS	621	0.00	0.00	0.0	0.0	0.000
64	VERDI	73	0.00	0.00	0.0	0.0	0.000
65	WADSWORTH	730	0.00	0.00	0.0	0.0	0.000
67	BAKER	1168	0.00	0.00	0.0	0.0	0.000
68	FLY	7190	0.12	2.10	80.0	4.7	0.001
69	LUND	694	0.00	0.00	0.0	0.0	0.000
TOTAL		109889	8588.04				100.000

Table D-15b

1983 SR71 AIRCRAFT ONLY

04-JAN-86

Altitude >20K ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	Percent of Total Events
01	CARSON CITY	146	0.20	1.28	2329.4	22.2	0.027
02	NEW RIVER	5036	43.89	0.92	3360.2	40.9	6.025
03	BUNKERVILLE	109	0.60	0.84	3539.9	23.3	0.082
04	GOODSPRINGS	1095	4.20	1.10	2952.6	34.1	0.577
05	HENDERSON	219	1.02	0.89	3420.9	26.1	0.140
06	LAS VEGAS	1642	1.14	1.48	1818.3	31.0	0.156
07	LOGAN	73	0.40	0.84	3539.9	21.5	0.055
08	MESQUITE	219	1.20	0.84	3539.9	26.3	0.165
09	MOAPA	1533	3.72	0.95	3247.7	32.2	0.511
10	NELSON	730	4.54	0.87	3492.5	32.4	0.623
11	N LAS VEGAS	511	1.72	0.89	3394.1	28.4	0.236
12	OVERTON	1131	6.20	0.84	3539.9	33.4	0.851
13	SEARCHLIGHT	803	5.12	0.89	3468.3	33.1	0.793
14	EAST FORK	730	0.72	1.58	1948.6	29.6	0.099
15	TAHOE	36	0.05	1.28	2329.4	16.1	0.007
18	CARLIN	1606	4.17	1.03	3159.6	33.4	0.572
19	EAST LINE	1533	12.18	0.80	3650.0	35.9	1.672
20	ELKO	3467	14.12	0.91	3499.5	37.6	1.938
21	JACKPOT	1168	4.48	0.80	3650.0	31.6	0.615
22	JARRIDGE	365	1.40	0.80	3650.0	26.5	0.192
23	MOUNTAIN CITY	3066	5.76	0.80	3650.0	32.7	0.41
24	TECOMA	2043	8.29	0.80	3650.0	34.2	1.131
25	WELLS	4161	22.62	0.84	3601.9	38.4	3.105
27	EMERALDA	3593	13.68	1.07	3036.2	38.4	1.878
28	BROWNE	1387	9.50	1.17	2801.6	38.2	1.304
29	EUREKA	2773	25.32	0.89	3516.8	40.0	3.476
31	GOLD RUN	1424	11.86	1.28	2506.2	39.9	1.678
32	MCDERMITT	1533	12.84	1.26	2787.9	40.1	1.763
33	PARADISE VALY	1387	6.84	1.13	3101.1	36.4	0.939
34	UNION	5621	63.88	1.36	2470.2	44.2	8.769
36	ARGENTA	2519	21.45	1.25	2539.4	42.3	2.944
37	AUSTIN	3138	26.06	0.86	3542.2	39.8	3.577
39	ALAMO	3941	12.60	0.84	3565.9	36.0	1.730
40	LALIENTE	3066	16.05	0.81	3629.4	37.2	2.293
41	PANACA	621	3.23	0.80	3650.0	30.2	0.443
42	PIOCHE	2737	18.73	0.90	3447.7	38.8	2.571
44	CANAL	182	0.25	1.28	2329.4	23.1	0.034
45	DAYTON	438	0.60	1.28	2329.4	26.9	0.082
46	MASON VALLEY	876	2.82	1.06	3075.5	32.0	0.337
47	SMITH VALLEY	474	0.47	1.58	1954.4	27.7	0.065
49	HATHORNE	1971	14.54	0.92	3428.2	37.9	1.998
50	MINA	1387	9.50	0.95	3372.5	36.3	1.304
51	SCHURZ	401	3.37	0.92	3395.0	31.6	0.463
53	BEATTY	4526	7.73	0.90	3371.5	33.7	1.051
54	GABBS	1569	10.40	0.98	3370.3	37.0	1.428
55	FAHRUMP	292	0.16	1.40	1999.3	22.0	0.022
56	ROUND MNTAIN	730	4.63	0.99	3359.5	33.6	0.638
57	TONOPAH	10183	40.84	0.97	3337.1	38.0	5.606
59	LAKE	5984	88.16	1.43	2053.7	44.9	12.107
60	VIRGINIA	219	0.30	1.28	2329.4	23.9	0.041
61	GERLACH	4343	50.66	1.58	1648.3	43.8	6.954
62	RENO	766	4.10	1.57	1779.6	37.0	0.585
63	SPARKS	621	4.51	1.59	1729.7	37.6	0.619
64	VERDI	73	0.10	1.28	2329.4	19.1	0.014
65	WADSWORTH	730	4.05	1.57	1772.9	37.0	0.556
67	BAKER	1168	12.31	0.84	3559.6	34.4	1.890
68	ELY	7190	75.76	0.87	3540.7	41.5	10.399
69	LUND	694	3.46	1.04	3185.2	32.8	0.475
TOTAL		109889	728.50				100.000

Table D-15c

1983 ALL SUPERSONIC AIRCRAFT

09-JAN-86

Altitude .1-30k Ft , Mach Number >1.0

TOWNSHIP DATA			SUPERSONIC EVENT DATA				Percent of Total Events:
Code	Name	Area (sq mi)	Number of Events (/yr)	Average Pressure (psf)	Average Carpet Area (sq mi)	CLDN (dB)	
01	LAKSON CITY	146	0.20	1.28	0.0	22.2	0.002
02	NEW RIVER	5036	43.89	0.92	0.0	40.9	0.471
03	BUNKERVILLE	109	0.66	0.91	0.0	24.2	0.007
04	GOODSPRINGS	1095	4.20	1.10	0.0	34.1	0.045
05	HENDERSON	219	1.47	1.37	0.0	29.4	0.016
06	LAS VEGAS	1642	145.14	2.54	0.0	43.8	1.558
07	LOGAN	73	0.44	0.91	0.0	22.8	0.005
08	MESQUITE	219	1.32	0.91	0.0	26.8	0.014
09	MURFA	1533	986.72	2.14	0.0	52.2	10.591
10	NELSON	730	4.88	0.95	0.0	32.6	0.052
11	N LAS VEGAS	511	4.10	1.85	0.0	32.6	0.044
12	OVERTON	1131	6.82	0.91	0.0	33.5	0.073
13	SEARCLIGHT	803	5.46	0.96	0.0	33.2	0.059
15	EAST FORK	730	0.72	1.58	0.0	29.6	0.008
16	TAHUE	36	0.05	1.28	0.0	16.2	0.001
18	CARLIN	1606	4.61	1.08	0.0	33.5	0.049
19	EAST LINE	1533	12.18	0.80	0.0	35.9	0.131
20	ELKO	3467	14.73	0.95	0.0	37.7	0.158
21	JACKPOT	1168	4.71	0.86	0.0	31.7	0.051
22	JACKBRIDGE	365	1.40	0.80	0.0	26.5	0.015
23	MOUNTAIN CITY	3066	6.36	0.88	0.0	32.7	0.068
24	TECOMA	2043	3.82	0.88	0.0	34.3	0.095
25	WELLS	4161	23.15	0.87	0.0	38.4	0.248
27	EMERALDA	3503	17.88	1.45	0.0	38.6	0.192
28	BEOWAWE	1387	9.88	1.19	0.0	38.2	0.106
29	EUREKA	2773	25.44	0.89	0.0	40.0	0.273
31	GOLD RUN	1424	10.03	1.28	0.0	39.9	0.129
32	McDERMOTT	1533	13.10	1.26	0.0	40.1	0.141
33	PARADISE VALY	1387	7.22	1.16	0.0	36.5	0.077
34	UNION	5621	64.07	1.36	0.0	44.2	0.688
36	ARGENTIA	2519	21.86	1.26	0.0	42.3	0.235
37	AUSTIN	3138	26.06	0.86	0.0	39.8	0.280
39	ALAMO	3941	2100.60	2.25	0.0	50.8	22.547
40	CALIENTE	3066	4241.05	2.14	0.0	54.4	45.502
41	PANATA	621	237.23	2.15	0.0	48.7	2.546
42	PIOCHE	2737	171.73	1.85	0.0	42.7	1.843
44	PANAL	182	0.25	1.28	0.0	23.1	0.003
45	DAYTON	438	0.60	1.28	0.0	26.9	0.008
46	MASON VALLEY	876	2.82	1.06	0.0	32.0	0.010
47	SMITH VALLEY	474	0.47	1.58	0.0	27.7	0.005
49	HATHORNE	1971	14.54	0.92	0.0	37.9	0.156
50	MINA	1387	9.50	0.95	0.0	36.3	0.102
51	SCHURZ	401	3.37	0.92	0.0	31.6	0.036
53	BEATTY	4526	336.73	2.13	0.0	42.6	3.614
54	BAHRS	1569	10.40	0.98	0.0	37.0	0.112
55	PAKUMF	292	1.68	2.51	0.0	31.8	0.018
56	ROUND MNTAIN	730	4.63	0.99	0.0	33.6	0.050
57	TUNOPAH	10183	457.84	1.57	0.0	41.8	4.914
59	LAKE	5984	88.16	1.43	0.0	44.9	0.946
60	VIRGINIA	219	0.30	1.28	0.0	23.9	0.003
61	PERLALH	4343	50.66	1.58	0.0	43.8	0.544
62	KENO	766	4.10	1.57	0.0	37.0	0.044
63	SPARKS	621	4.51	1.59	0.0	37.6	0.048
64	VERDI	73	0.10	1.28	0.0	19.2	0.001
65	WADSWORTH	730	4.05	1.57	0.0	37.0	0.043
67	BAKER	1168	12.31	0.84	0.0	36.4	0.132
68	FLY	7190	75.88	0.87	0.0	41.5	0.814
69	LUND	694	3.46	1.04	0.0	32.8	0.037
TOTAL		109887	9316.54				100.000

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-8